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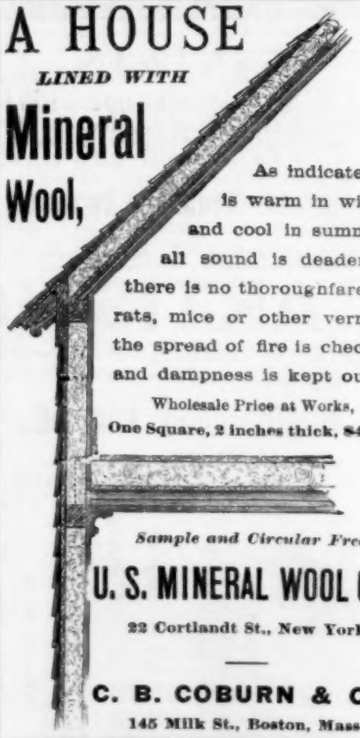

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One Square, 2 inches thick, $4.00.

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Hand-Hoists operated with ropes or cranks. Automatic Hatch-doors. Governors, and Safety-catches.
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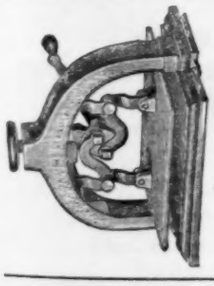
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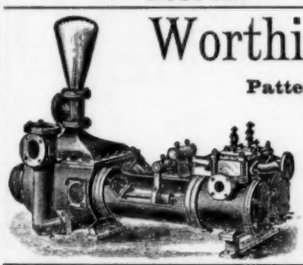
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HANOVER FIRE INSURANCE CO.

Cash Capital	$1,000,000.00
Reserve for Re-insurance	635,741.16
Reserve for all other Liabilities,	96,655.57
Net Surplus	832,744.56
Total Assets, January 1, 1883	2,565,141.29

BUILDING MATERIALS.
Reported for the American Architect and Building News.

BRICK.—₱ M.	New York. (Wholesale Prices.)	Boston. (Prices to Builders and Contractors.)	Chicago. (Prices to Builders and Contractors.)	Philadelphia. (Prices to Builders and Contractors.)
Common: *Cargo afloat.*				
Pale	$2 50 @ $3 50	Eastern	Building Brick	Hard
Jersey	4 25 @ 4 75	7 50 @ 8 00	8 00 @ 8 50	7 50 @ 8 50
		Bay State Hard		Salmon
Up River	5 00 @ 5 50	9 00		₱
Haverstraw Bay	5 50 @ 6 00	Domestic Com.	Indiana Pressd	Stretchers
" 1st	6 00 @ 6 50	8 00 @ 9 00	16 00 @ 28 00	11 00 @ 12 50
		Domestic Face	St. Louis Fronts	Pressed
		19 00 @ 20 00	25 00 @ 30 00	20 00 @ 23 00
Fronts:				
Croton, Brown	13 @ 14 00	Philadelphia	———	———
" dark	14 @ 15 00	40 00 @ 45 00	———	———
" red	14 @ 15 00	Phila. mould	———	———
Chicago pressed		50 00 @ 80 00	22 00 @ 35 00	———
Chicago Moulded			65 00 @ 350 00	
Baltimore	37 @ 41 00		@ 55 00	———
Glens Falls — white	30 @ 35 00	Glens Falls	———	———
Philadelphia	@ 27 00	25 00 @ 26 00	42 00 @	———
Trenton	@ 27 00		40 00 @	———
Milwaukee		Glens Falls	25 00 @	———
Moulded:		Mould.	60 00 @ 100 00	———
Clark's Glens Falls — Red	25 00 @ 27 00	30 00 @ 35 00	30 @	———
" — White	30 00 @ 35 00	35 00 @ 40 00	35 @	
White " Mold,	45 00 @ 60 00	45 00 @ 60 00	55 00 @ 65 00	
Enamelled: *Imp.*				
Enamelled (edge.)	85 00 @ 100 00	@	@ 100 00	
Enamelled (edge and end)	90 00 @ 115 00	@	@ 120 00	Dom. ₱ @ 65 ₱ @ 85
CEMENT, LIME, etc.—(₱ *cask.*)				
Chicago Lime in bulk			65 @ 75	
Wisconsin "			80 @ 90	
Rosendale Cement	80 @ 1 00	₱ 1 50	*Not Sold.*	1 50 ₱ 1 75
Utica, Akron, Buffalo, Louisville, Milwaukee	*Not sold.*	*Not sold.*	1 00 @ 1 25	*Not sold.*
Portland (English)	2 60 @ 3 10	@ 3 20	3 00 @ 3 25	3 25 @ 3 50
" (Saylor's Am.)	2 05 @ 2 40	2 50 @ 3 00	2 75 @ 3 00	2 50 @ 3 00
" (Dyckerhoff)	2 75 @ 3 15	3 00 @ 3 50	3 25 @ 3 75	3 00 @ 3 25
" (Lafarge)	3 50 @ 4 50	*Not sold.*	3 75 @ 4 25	4 50 @
" (Star)	2 76 @ 3 00	*Not sold.*	*Not sold.*	*Not sold.*
K. B. & S. (Eng.) Portland	2 85 @ 3 10		3 35 @ 3 50	3 00 @ 3 25
Burham " "	2 60 @ 2 80		3 15 @ 3 35	2 75 @ 3 00
Vorwohler	2 65 @ 3 25		3 00 @ 3 25	
German (Fewer)	2 50 @ 2 70	3 15 @ 3 35	3 15 @ 3 35	
" (Alsen)	2 50 @ 2 80	3 00 @ 3 50	3 15 @ 3 35	2 90 @ 3 25
Selenitic		1 65	*Not sold.*	
Hydraulic Lime of Teil	@ 5 00		*Not sold.*	
Roman	2 75 @ 3 00	@ 3 20	2 75 @ 3 25	3 50 @ 3 75
Keene's coarse	5 00 @ 6 00	@ 7 50	8 00 @ 9 00	6 50 @ 7 00
" fine	9 25 @ 10 25	@ 11 50	12 00 @ 13 00	11 50 @ 12 00
Lime:				
Rockland and Rockport, (Com.)	@ 1 00	@ 1 10	*Not sold.*	1 00 @ 1 25
Rockland and Rockport, finish	@ 1 20	@ 1 15	*Not sold.*	
State, com. cargo rates (nom.)	75 @ 80	*Not sold.*	*Not sold.*	*Not sold.*
State, finishing "	95 @ 1 10	*Not sold.*	*Not sold.*	*Not sold.*
Plaster of Paris (calcined.)	1 30 @ 1 35	1 70 @ 1 90	@ 1 75	2 00 @ 2 25
" (casting)	1 50 @ 1 65	@ 2 25	@ 2 00	2 25 @ 2 50
Hair (Cattle) ₱ *bush.*	21 @ 23	@ 30	30 @ 35	25 @ 33
" (Goat)	30 @ 35	@ 30	35 @ 40	@
Sand, ₱ *load*	1 00 @ 1 25	@ 1 50	100 @ 1 25	@ 1 50
STONE. (₱ *cubic foot, rough.*)				
Granite: (*Maine*)		@ 60		75 @ 2 00
Limestone:				
Bedford	@ 1 00	95 @ 1 00	50 @	3 75 @
Joliet	@		35 @ 55	
Lemont	@		35 @ 60	
Serpentine	@		80 @ 90	75 @ 1 25

(Continued on page vi.

10

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"MORTON'S METAL"

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Cable and Champion Sash-Chains

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Can be easily applied to any window, and gives SATISFACTION wherever used. Samples sent to any ARCHITECT free on application. Now in use in all the leading cities throughout the United States.

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	New York. (Wholesale Prices.)	Boston. (Prices to Builders and Contractors.)	Chicago. (Prices to Builders and Contractors.)	Philadelphia (Prices to Builders and Contractors.)
Foundation:				
Dimension	@	5 00 ₱ ton	20 @ 28	30 @ 5 00
Block	@	4 60 ₱ perch	8 50 ₱ cord.	50 @ 6 00
Rubble	@	1 25 @ 1 50	8 50 @	
Bluestone: (₱ *sq. ft.*)				
Sidewalk	30 @ 5 00	40 @ 1 75	75 @ 1 00	70 @ 90
Planed	50 @ 6 00	75	50 @ 1 00	1 10 @ 1 25
Sandstone.				
Longmeadow		75 @ 85		
Brown (Connecticut)	1 00 @	1 25 @ 1 45	1 50 ₱ cub.ft.	1 25 @ 1 75
Amherst	1 00 @	90 @ 1 00	55 @ 65	
Berea	75 @ 1 00	80 @ 90	45 @ 55	90 @ 1 10
Berlin	75 @ 1 00	80 @ 90	55 @ 65	
Bay of Fundy	@ 1 00	*Not sold*	*Not sold.*	
Belleville	80 @ 1 25	1 25 ₱ ½ 1 35	"	
New Brunswick	@ 1 00	90 @ 1 00	"	
Caen	@	@ 2 00	"	
Marble (₱ *cu. ft.*)				
Lee, Mass.	@	1 75 @ 2 50	*Not sold.*	2 00 @ 2 50
Rutland, white	@	@ 3 00	3 50 @ 5 00	2 25 @ 2 50
Sutherland Falls	1 25 @ 1 75	@ 2 00	3 50 @ 5 00	2 50 @ 4 00
Glens Falls, black	@	2 00 @ 3 00	*Not sold.*	4 00 @ 4 50
Italian, blue-veined	@	@ 60	@ 4 40	—— @ ——
" Sienna	@	3 00 @ 3 50	*Not sold.*	3 25 @ 6 50
Tennessee, red	@	1 25 @ 2 50	@ 4 00	2 00 @ 3 00
" Knoxville	@	85 @ 90	@ 4 00	@ 1 50
Pennsylvania, blue	@		*Not sold.*	2 23 @ 2 50
Vermont, white	@	1 50 @ 2 00	3 50 @ 5 00	
Slate: Roofing (₱ *square*)				
" green	7 00 @ 8 00	4 50 @ 7 00	6 25 @ 8 10	6 25 @ 7 00
" purple	7 00 @ 8 50	5 50 @ 6 50	@ 8 60	@ 7 00
" red	@ 15 00	13 00 @ 14 00	——@ 16 00	@ 12 00
" black, Lehigh	—— @ ——	Brownville, Me.	7 20 @ 7 60	@ 4 50
" " Chapmans	—— @ ——	6 50 @ 9 00	7 30 @ 8 00	@ 4 25
Tiles, Am. ₱ M	@	Monson, Me.	*Not sold.*	@ 15 00
		5 50 @ 8 00		
LUMBER.—₱ M. (*Ordinary dimensions.*)				
Boards:				
Pine, 1st quality, clear	65 00 @ 75 00	50 00 @ 53 00	44 00 @ 49 00	
" 2d quality	55 00 @ 60 00	42 00 @ 44 00	40 00 @ 46 00	
" 3d quality	18 00 @ 22 00	35 00 @ 38 00	37 00 @ 44 00	
Spruce	@ 25 00	11 00 @ 12 50	*Not sold.*	
Hemlock	ea. 17 @ 18	11 00 @ 12 50	@ 10 00	11 50 @ 15 00
Yellow pine	20 @ 40	30 00 @ 33 00	@ 28 00	16 00 @ 18 50
Cypress	@	32 00 @ 35 00	@	@
Clapboards:				
Pine	@	33 00 @ 55 00	14 00 @ 22 00	—@—
Spruce	@	23 00 @ 30 00	*Not sold.*	—@—
Framing Timber:				
Pine			13 00 @ 15 50	25 00 @ 35 00
Spruce	14 00 @ 18 00	13 50 @ 14 50	*Not sold.*	18 50 @ 20 00
Hemlock	12 00 @ 15 00	@	13 00 @ 19 00	12 00 @ 13 00
Yellow pine	20 00 @ 30 00	21 00 @ 25 00		22 00 @ 24 00
Laths:				
Pine	@	2 25 @ 2 35	2 25 @	—@—
Spruce	2 20 @ 2 30	2 15 @ 2 25	*Not sold.*	2 25 @ 2 35
Shingles:				
Pine, shaved ₱ M	5 00 @ 6 00	@	*Not sold.*	
Pine, sawed "	4 00 @ 5 00	@ 4 50	2 25 @ 2 60	
Spruce, sawed "	2 50 @ 2 75	@ 1 50	*Not sold.*	
Redwood ₱ 125	1 40 @ 1 60	3 75 @ 4 50	5 50 @ 8 00	30" $10 @ 28
Cedar, split ₱ M	@	@	*Not sold.*	24" 8 @ 21
Cedar, sawed "	@	2 00 @ 3 50	@ 2 30	20" 5 50 @ 14
Cypress. Split...7 x 24. "	18 00 @ 20 00	5 50 @ 6 00	4 00 @ 4 50	13 00 @ 20 00
Miscellaneous:				
Piles ₱ ft.	4½ @ 6	Piles 6c. ₱ ft.	*Not sold.*	
Fence pickets, Spruce	8 00 @ 10 00	10 00 @ 18 00	Pine, 8 @ 12	12 00 @ 14 00
Cedar posts, 9 ft. (sq. posts.)	@	25 @ 35	9 00 @ 21 00	70 @ 1 25
Chestnut "	@	25 @ 35	*Not sold.*	28 @ 36
Finishing Woods: ₱ M. (*First Quality, Kiln-dried.*)				
Ash	@ 55 00	38 00 @ 48 00	35 00 @ 40 00	
Cherry	80 00 @ 120 00	60 00 @ 90 00	75 00 @ 85 00	55 00 @ 65 00
Chestnut	@ 55 00	38 00 @ 50 00	45 00 @ 50 00	60 00 @ 80 00
Butternut	40 00 @ 60 00	60 00 @ 70 00	50 00 @ 60 00	55 00 @ 65 00
Mahogany, Baywood	@ 180 00	100 00 @ 150 00	150 00 @ 180 00	100 00 @
" St. Domingo	@ 350 00	180 00 @ 250 00	250 00 @ 300 00	
Maple	45 00 @ 50 00	45 00 @ 65 00	30 00 @ 35 00	30 00 @ 50 00
Oak, red	@ 70 00	@ 50 00	35 00 @ 40 00	35 00 @ 45 00
" white	@ 70 00	@ 55 00	35 00 @ 40 00	55 00 @ 65 00
" quartered	@ 90 00	65 00 @ 70 00	45 00 @ 50 00	70 00 @ 80 00
Sycamore quartered		@ 65 00	45 00 @ 50 00	
Pine, clear	65 00 @ 70 00	30 00 @ 65 00	45 00 @ 50 00	65 00 @ 90 00
Redwood	60 00 @ 70 00	60 00 @ 70 00	60 00 @ 70 00	100 00 @
Rosewood ₱ lb	@ 6		@ 7	
Walnut, black	125 00 @ 150 00	85 00 @ 100 00	80 00 @ 100 00	160 00 @ 200 00
Whitewood	45 00 @ 50 00	38 00 @ 45 00	30 00 @ 35 00	20 00 @ 30 00
Yellow pine ₱ M	@ 45 00	40 00 @ 45 00	30 00 @ 35 00	30 00 @ 35 00
Gumwood, best red			30 00 @ 35 00	
PAINTS. (*In oil,* ₱ *lb.*)				
White lead, Am	5½ @ 6	5½ @ 6	5½ @ 5½	4 @ 5½
" Zinc, "	5 @ 8½	5 @ 8	7 @ 11	4 @ 6
Red, Am.,	6 @ 6½	6 @ 6½	5½ @ 6	
" Venetian	6 @ 10½	7 @ 12	1½ @ 2½	7 @ 10
" Vermilion	55 @ 60	55 @ 60 dry	50 @ 60	Am. 14 @ 22
Red Indian, Eng.	12 @ 20	12 @ 20	12 @ 20	12 @ 20
Yellow Ochre	6 @ 15	7 @ 12	3 @ 15	7 @ 9
" Chrome	12 @ 20	18 @ 25	12 @ 25	12 @ 25
Green (chrome)	8 @ 13	8 @ 20	8 @ 20	9 @ 15
Green, Paris,	25 @ 40	25 @ 40	16 @ 35	16 @ 22
Black, lamp,	15 @ 28	15 @ 25	8 @ 30	8 @ 12
Blue, ultramarine	12 @ 18	18 @ 30	10 @ 35	11 @ 35
Oil, linseed, (raw) (₱ gal.)	53 @ 54	54 @ 59	48 @ 49	52 @ 55
" " boiled	56 @ 57	57 @ 62	51 @ 53	57 @ 59
Turpentine	30 @ 31	35 @ 42	32 @ 34	45
Varnish, coach		1 50 @ 6 00	1 25 @ 2 00	1 75 @ 5 25
Shellac		2 50 @ 3 00	3 25 @ 4 00	1 10 @ 1 75
Putty	2 3	2 @ 4	02 @ 03	2 @ 2½
Whiting (dry)	50 90	1 @ 1½	1 2	1 1½
Paris white, (Eng.,)	2 3	2 @ 3	2 2½	1½ @ 1½
Litharge, Am	5½ @ 5½	6½ @ 7	6½ @ 10	6½ @ 7½
Sienna, (burnt)	12 @ 17½	14 @ 20	4 @ 16	9 @ 14
Umber, "	11 @ 16½	14 @ 20	@ 10	9 @ 14

(*Continued on page* vii.)

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With Wrought and Malleable-Iron fastenings.

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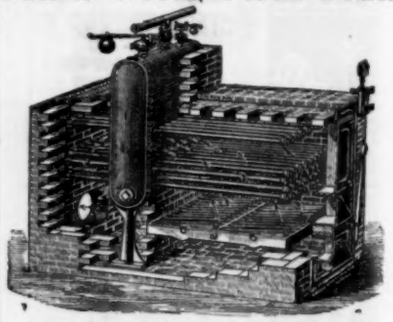

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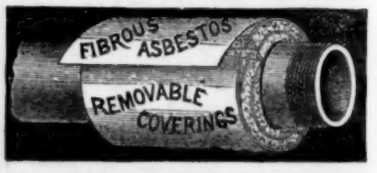

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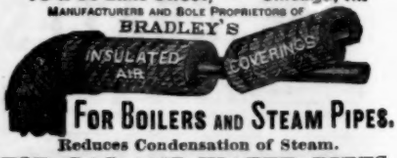

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THOMAS S. DIXON & SONS,
MANUFACTURERS OF
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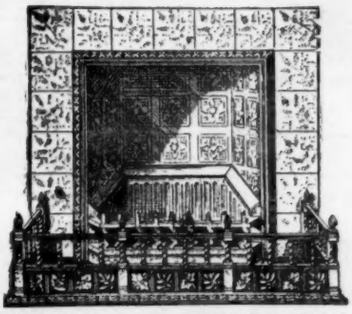

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IMPORTERS OF ENGLISH AND FRENCH FIRE-PLACE FITTINGS.
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This radiator is constructed upon the principle *of a coil.* A diaphragm separates one leg of the loop from the other, so that steam entering passes up one leg to the top of the loop, down the other leg to the opposite side of the diaphragm, thence into the next loop, and so on through the Radiator, securing a PERFECT CIRCULATION and an IMMEDIATE heating of the whole Radiator. It is adapted to **High** or **Low** pressure, and surpasses all others in the **perfection** of its operation, beauty of design, and simplicity of construction. The loops or sections are made complete and independent of each other, and each loop is screwed to the adjacent loop by a double-thick wrought-iron nipple, thus forming a perfect joint not affected by contraction or expansion.

No packing is used, and there are but **two joints** in each four feet of heating surface (36-inch size), while the ordinary pipe radiator has **eight joints.** It has the largest radiating surface of any in the market to space occupied.

As each loop or section is an exact duplicate of the other, **the size of a radiator** may be **increased** or **diminished** if desired, and in case of damage by frost or otherwise, it can be easily repaired without removal from the building. This is true of no other Radiator and is very important. Being constructed without the cumbersome base so objectionable in all other radiators, there is no accumulation of **dirt** and **dust,** and the most perfect radiation is secured.

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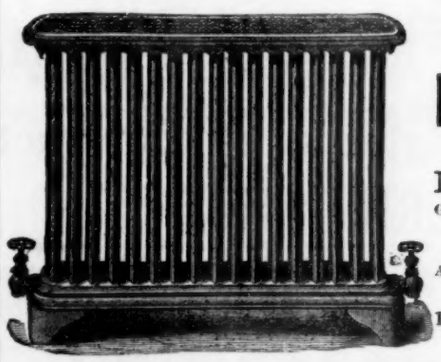

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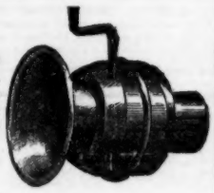

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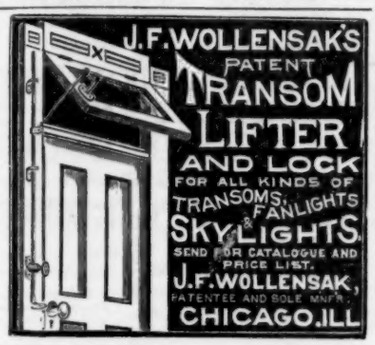

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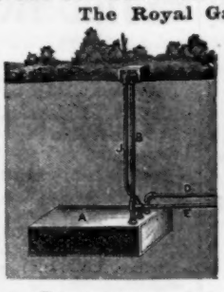

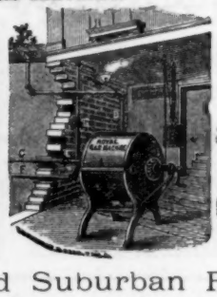

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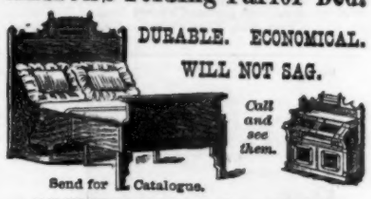

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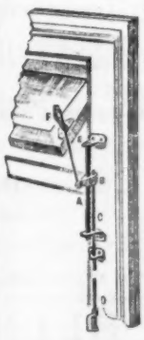

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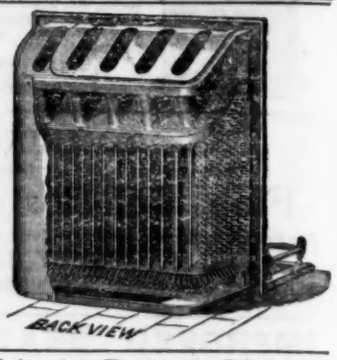

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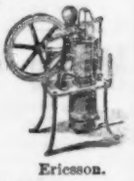

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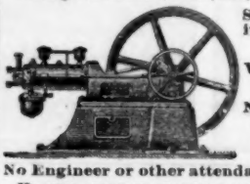

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NOVEMBER 29, 1884.

Entered at the Post-Office at Boston as second-class matter.

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WE believe that our subscribers will welcome with the same cordial pleasure that we have in making it the announcement that during the coming year the value and interest of our illustrations will be increased by the regular issue of gelatine prints (heliotypes), from the natural object. As there are probably many who do not understand what is meant by a heliotype — we have encountered many who suppose our regular photo-lithographic illustrations must be heliotypes, since they are printed by the Heliotype Printing Company — we will explain that by "heliotype" is meant such prints as those of Trinity Church, Boston, the Farragut Statue, New York, the Fairbanks House, Dedham, Mass., the Town-Hall and Library of North Easton, Mass., which, with others, we have published from time to time, and we call their attention to the illustration of the Young Men's Christian Association Building in Boston, which is published in this issue. It is such prints as this, that we will next year issue, once each month, to those that are willing to pay for them. It is our sincere hope that a large portion of our subscribers will give their support to this new departure; for if it results as favorably as we now anticipate, — and present indications show that our hope already has a very substantial basis in fact — we can in the following year increase the number of heliotypes to the manifest increase of the value of the journal to our subscribers. In fact, in view of our facilities, there is no reason why the *American Architect* should not become the leading architectural journal of the world, so far at least as illustrations are concerned. The harvest within reach is inexhaustible, and all that is needful is the pecuniary support of our subscribers, to enable us to garner it into our pages.

WE trust it has not escaped the notice of our subscribers that we have recently permanently increased the number of our illustrated pages, and that they perceive in this an implied promise that as the journal grows and prospers, so shall it increase in volume and value to its subscribers. Any one who will look over a complete volume of the *American Architect*, and then compute how much he would have to pay for the same amount of matter made up into books of the ordinary form and size, will get an idea of how disproportionately small the subscription price is to the real value of the year's issue. One of the most peculiar foibles of human nature is the feeling that one of the most reasonable economies a man can practise is to stop his daily or weekly paper, but the falsity and wasteful unwisdom of such economy can probably be seen by any reasonable person who stops to think over it. It is pretty certain that in the case of an economical architect, for instance, although he might lay down fifty-one successive issues of an architectural journal in weariness and disgust, with the feeling that there was "nothing in them," yet he would probably find in the fifty-second something he would not have missed for many times the subscription price: something that may keep him out of a lawsuit, or help him in one he had begun; some fact which would prevent his building from falling down; some notice of a new competition, or some hint he could borrow from a brother architect's work, which would help him win. It really seems to us — as men and not as editors — that giving up one's daily or weekly paper is the last, and not the first, economy an active-minded man should practise.

IT is a gratification to us that we receive so many letters expressing satisfaction with the publication of "photo-caustic" prints — not unqualified and indiscriminate praise to be sure, but warm enough to satisfy us that we were right in not abandoning the process at the first onslaught of hostile criticism. We repeat that we do not use this process for the purpose of showing every detail of a building: that is beyond the possibilities of the process at present, and can be left to be shown in heliotypes, which will give all detail perfectly; but we do use it that our subscribers may gain a speaking acquaintance, as it were, with buildings which they may have heard of but never seen, or which they may desire to see more of, after having in this way gained an introduction. We should like to hear from the most competent authorities what they consider the relative architectural value of, for instance, the photo-caustic print of the Church of St. Nicholas at Ghent, and of Cotman's etching of St. Ouen, at Rouen, published in our last issue. We think the comparison would be a fair one, for we believe that few will deny to Cotman a very high rank as an architectural draughtsman. The increase of the number of illustrations has this personal interest to contributors: namely, that they will not have, hereafter, to wait so long for the appearance of accepted contributions, and will not have to take up the journal week after week only to find that "some other fellow's" design had been published instead of theirs — not because it was better, but simply because it had reached us sooner.

WE take sincere pleasure in learning of the complete success of the movement for establishing a western association of architects. The preliminary meeting, called in accordance with a suggestion made by the *Inland Architect* some months ago, took place in Chicago on Wednesday, November 11, and was attended by about one hundred and twenty-five of the best-known architects in Chicago, Milwaukee, St. Paul, St. Louis, and many other cities. A committee of Chicago architects received the visitors, providing generously for their comfort, and doing everything that could be done for the speedy transaction of the important business to come before the meeting. We publish elsewhere a report of the proceedings, and will not here anticipate it; but the feeling of the gentlemen present seems to have been unanimously in favor of the establishment of an association working in concord with the American Institute of Architects, but representing more particularly the interests of the profession in the West. Although the American Institute has had no more valued or useful members than many of the Western architects, its influence has been unquestionably too remote to give that moral support which professional men need. Even Eastern architects find the authority of the Institute less substantial, so far as regards its effect upon their individual business, than that of their local societies, and to their brethren in Chicago and St. Louis the quarterly meetings of the Trustees in New York are of still less practical service, so that the formation of a professional body in the West, which should unite the direct influence exerted by home associations with the authority conferred by a large membership, was, if not yet absolutely necessary, at least most fortunate; and the spirit in which the members of the Convention began their work of organization, as evinced in the admirable address of Mr. Burnham, the President, promises the best results in the future. We shall hope, long before the time of the next meeting, to note the good effect of the establishment of the Association upon professional interests in the West.

THE committee which has had in charge the matter of erecting in Boston a statue of Paul Revere has at last adopted a model, and will now begin the task of collecting the money necessary for carrying it into execution. Our readers will remember the competition for models which took place six or eight months ago, and unsatisfactory as were the terms offered to competitors, we are glad to be able to say that in the end the committee has proved loyal to the understanding

implied in its programme, and has retained Mr. Dallin, the winner of the first prize in the competition, as the sculptor for the statue, only requiring of him such modifications of his original design, which was probably a hasty conception, as seemed necessary to give it the character desired. The City of Boston has promised, we believe, to contribute five thousand dollars toward the cost of the monument, but it will be necessary to raise twenty thousand more among private individuals, and it is more than likely that some years will elapse before the full amount will be obtained. Meanwhile, we hope that Mr. Dallin, who has his artistic reputation still to make, will be able to prepare himself adequately for an opportunity such as falls to the lot of most sculptors only two or three times in the course of their lives. His subject is a good and inspiring one; his field is a comparatively fresh one, for only one other equestrian statue exists in Boston, and he will have, in the people of the city, an audience as generously appreciative of original and meaning work as he need desire.

THE people who live near the line of the elevated railway in New York will rejoice to learn that a movement is now in progress for applying electricity as a motive power to the trains of the railway. Some two years ago a promising device for the purpose was introduced by Mr. Field; and later, Mr. Leo Daft has succeeded in operating an electric railway in New Jersey; but the managers of the elevated lines have hesitated to adopt any experimental system. Now, however, the Siemens electric road in Berlin, nine miles long, has been for some time in successful operation, and is to be extended to thirty miles in length; and another line, known as the Bentley-Knight road, is doing good service in Cleveland, so that the moment seems to have arrived for doing away with the steam and smoke which have so long annoyed the New York people, to substitute the new motive power. In order, however, not to lose the benefit of the most recent inventions, the railway directors have arranged for a sort of competition, in which all the makers of electric railways are to give tests of their inventions upon the elevated tracks, before a commission of experts, who will compare them and decide as to their respective merits; and the best system, in the opinion of the commission, is to be adopted, unless unforeseen circumstances should prevent, to replace steam power for moving all the trains belonging to the elevated railway corporations. One feature of this competition is, however, novel. Instead of handing over all the profits of the affair to the lucky winner of the first prize, leaving the others to hide their diminished heads and their lightened pockets in some safe seclusion, the electric-railway contractors are in any case to share the rewards of their efforts, and, after the competition has been decided, a company is to be formed, including all the contractors, which is to control all the patents for electric railways now in force in the United States; and this company, stock in which will be allotted by arbitration to the different members, is to remodel the elevated roads to suit the particular system adopted. The remodelling will be a simple process. Between the rails of each present track a third rail will be laid, insulated by supports of glass, which will serve to transmit the current, generated by a dynamo-machine at a central station, to the motor attached to each train. Passing through the motor, which is not a complicated machine, the current will give the necessary impulse to the wheels, and will finally escape to the two outer rails, through which it will return to its starting-point. Experience shows that the movement of the trains is as readily controlled on this system as on any other, and the advantage of employing it for a railway, the tracks of which are laid within a few feet of the second-story windows of many miles of streets, is obvious.

MR. DANIEL D. BADGER, the first person in this country to use iron on a large scale for building purposes, died last week at his home in Brooklyn, N. Y., at the ripe age of seventy-eight years. Mr. Badger was born on Badger's Island, in the harbor of Portsmouth, N. H., in 1806, and after his short school life was completed, began work in a blacksmith's shop in Portsmouth. A few years later he entered business for himself as a manufacturer of saws in Woburn, Mass., and prospered, until a fire destroyed his factory, and he removed with his savings to Boston, where he established a foundry and rolling mill, which was very successful, and brought its owner in a few years a considerable fortune. Always enterprising and ingenious, he conceived the idea that iron might be used as a building material much more extensively than was then the case, and in 1842 he erected in Boston the first building in the world with exterior columns and lintels of iron, under a guarantee, which was exacted from him, that if the iron so used proved unsuited to the purpose, he would substitute other materials at his own expense. It is hardly necessary to say that he was not called upon to put granite piers and lintels in place of his light iron columns, but was soon employed instead, to the utmost capacity of his foundry, in applying the same novel idea to other buildings. Soon after he was obliged, in order to supply the increasing demand for his work, to remove to New York, where he first built a foundry in Duane Street, and afterwards another one, occupying an entire block, between Thirteenth and Fourteenth Streets, and Avenues B and C. His business was then transferred to a corporation under the name of the Architectural Iron Works, which erected iron buildings in almost every large city in the United States, in Egypt, and in Cuba. In 1873, having raised the Architectural Iron Works to the highest pitch of reputation, he retired from active business, just in time to escape the troubles which soon came upon his associates through the competition of the rivals whom their previous success had raised up about them, and bearing with him the veneration of all members of the trade, with a deserved public reputation for the skill and enterprise shown in such undertakings as the Grand Central Railroad Station in New York, the contract price for the iron-work in which was, if we recollect rightly, more than a million dollars, and which presented the problem of the widest roof of a single span in this country, and the widest but one, at that time, in the world. The train-house portion of this great building was erected with extraordinary rapidity, by means of a travelling stage, upon which the arched girder trusses were successively built and placed in position. A short time afterwards the Manhattan Market, a building covered with an arched girder roof of a span nearly as great as that of the Grand Central Station, and even more elegantly designed, was erected in the same skilful manner. Second only in importance to these are the many buildings with cast-iron fronts erected by him in various parts of New York, which, although presenting no difficult engineering problems, are remarkable for the ingenuity with which a complete structure of iron is substituted for the masonry until then universally used. To us, who have seen the results of his work, an iron building is an every-day affair; but to begin, as he did, with a brick and stone structure, and replace every detail, even to the sidewalks and curbstones, with a new material, showed a patience and discernment which may well be called extraordinary.

THE New York *Evening Post* publishes a long editorial in relation to the copper industry of this country, which contains a great deal of useful information and suggestion. We imagine that few people realize the immense increase in the domestic production of copper which has taken place within the last few years. In 1880, the total output of the metal in the United States was estimated at twenty-seven thousand tons, of which the Lake Superior mines furnished twenty-two thousand, or about eighty-two per cent. In 1881, the Lake mines increased their production to twenty-four thousand tons, but those of other districts gained still more, and the Lake copper was only seventy-six per cent of the whole. In 1882, the Western mines had gained still more, and in 1883, the whole production of the country was fifty-eight thousand tons, or more than double that of 1880, and the Lake copper was only fifty-two per cent of the total. This year it is estimated that seventy thousand tons will be brought to market, of which the Lake mines will furnish thirty-four thousand. In other words, while the Lake mines have in four years increased their output from twenty-two to thirty-four thousand tons, or about fifty-five per cent, the other portions of the country will furnish this year more than seven times as much copper as they did in 1880. The cause of this important change in the copper mining industry is, of course, the discovery of new and productive mines. It is hardly two years since a small group of mines was opened in Montana, which will this year furnish alone at least twenty thousand tons of the metal, or nearly as much as the whole production of the Lake Superior mines in 1880. In Arizona, also, several very rich mines are worked, turning out about twelve thousand tons during the year, and there are mines in several other states and territories.

THE WESTERN ASSOCIATION OF ARCHITECTS.

FOR the past six months the *Inland Architect and Builder*, of Chicago, has voiced editorially the expressions that have come to it, favoring and recommending the forming of a Western Association, composed of architects of the West and South. The following is a brief summary of these editorials: —

"The history of all trades and professions points to united effort, through organization, as the only means of establishing desired reforms, and of elevating and improving those trades and professions; and if the profession of architecture is to take a higher plane, and be more respected in the West, its only hope is in active organization. The American Institute has for many years sought to enlist the interest of the profession in the West, but has failed to do so in any general or active sense. Seeing this, and realizing the benefits of organization, many Western architects have by letter and in person expressed to the *Inland Architect and Builder*, the belief that an association distinct from, but in harmony with the American Institute, Western in spirit, with headquarters centrally located, and with annual meetings held where they could be attended without long journeys, involving large expense and much loss of time, would have the active support and co-operation of the West. This feeling becoming widespread, led the *Inland Architect and Builder* to announce the call for a convention of architects of the West and South, to be held at Chicago, November 12th, 1884, for the purpose of forming a Western Association of Architects. In response about two hundred have signified their intention of being present, and many more have expressed sympathy with the movement, stating that they would support such an organization. There need be no conflict between an independent Western association and the American Institute, both having kindred aims, one would aid the other. With two distinct organizations a lively interest would be awakened and a healthful emulation be fostered, the West striving to outdo the East in the good work of establishing needed reforms."

On November 12th, there assembled at the rooms provided for the purpose in Chicago, some one hundred and twenty-five architects from Cleveland and Cincinnati westward, and from as far south as Tennessee.

The meeting was called to order, and a temporary Chairman and Secretary elected. A Committee on Credentials was appointed, who continued in session during the Convention.

At the opening of the afternoon session Chairman D. H. Burnham, of Chicago, delivered the following address: —

The advanced civilization we live in demands of us a line of action differing somewhat from what has gone before. Almost up to the present century an architect's work has been confined to some one building or set of buildings. In the earliest times the architect was the master-builder, and often finished but one piece of work during his career. This has been true until within the last two or three hundred years. It was easy for him, comparatively speaking, to do his work to the satisfaction of his client, and to leave a monument finished in every detail.

To-day a man in active practice is expected to design everything, from a cottage to an ornamental public building. From Bazaleel, who was designated by God to erect a tabernacle in the wilderness, down through Phidias and Vitruvius, John of Gloucester, Irvin of Steinbach, and Robert de Beverley, to Michael Angelo, an architect's work has been confined in narrow channels, and it may well be doubted whether these masters could have left a name had they been obliged, as we are, to turn from a temple or palace to a dozen other totally different problems all in one year. The times have changed, and we of to-day are loaded with such emergencies as were unknown to the ancients. This should give courage to him who is dissatisfied with his work. If, in spite of the multiplex problems laid out for him, he succeeds in evolving one satisfactory building, he will have done quite as much as the architect of old. It is of importance to us who make up that latest product of time, the architectural profession of the West, to recognize the great changes which have come over the practice of our business. We ask ourselves why ancient buildings were good. M. Viollet-le-Duc has shown, and I think justly, that the beautiful temple called the Parthenon was the result of constant and minute criticism of entire educated Athens. This shows the law of our nature, working toward a distinct end. Where there is a gathering of men, all intent on one purpose, the result must be the perfect expression of the work of them all.

Society to-day calls on us for a much wider range of thought than was formerly expected of an architect. On account of the condition of our life, we are in a measure cut off from that peculiar help the old architects had from each other. We now principally need the restoration of the spirit of brotherhood which has been lost. We certainly are capable of doing more than those who went before. We have their work before us, both in general and detail. We have photographs of their monuments as a whole, the colored prints of their interiors, and the scaled measurements of their most delicate parts. We have their writings, with the conclusions of their lives. With all these and our own facilities for perfect intercommunication, which the men of old most sorely lacked, why is it we do so little which is thoroughly satisfactory, even to ourselves?

Haste, resulting from feverish push, is responsible for much. We are asked for complete results in a period which to the ancient would have been too short for his first conception. Were it not for other things, there could be no satisfaction to the mind of an earnest man in doing his work, but in spite of our being so hurried by the rush of modern life, we have a chance to guard ourselves against mistakes if we will but analyze our position. We all need kindly criticism. No man can be a law unto himself, and the best effort of the brightest intellect must be inferior to what it might be if the designer would submit his work to the scrutiny of others in his profession. We look to this convention to inaugurate an era of good feeling among the architects of the West. Recognizing our standing in the advance of civilization, we feel that combined effort would save to us and to posterity the best thoughts of us all; that working merely as individuals, entertaining a narrow, jealous disposition toward others, we cut ourselves off from those corrections which are absolutely essential to prevent such glaring flaws as inevitably come from haste.

It is not intended to claim extra brilliancy of intellect or warmth of heart to us of the West, but the conditions which invariably produced perfect styles in the past are now once more active among us. What made the architecture of Athens? I have quoted from a celebrated French author to show that the results came from freely-expressed criticism of the populace, but this itself arose out of what was far more potent. Athens was a commercial city; to it came men of all nations; at its port were seen the dresses of all tribes, and there were heard the tongues of the civilized world. From the very nature of things the Athenians were the brightest spirits of the times, and probably the best informed men then on the globe. The restless activity of their minds and their adventurous feelings had brought them from far divergent lands; they were animated to overcome all difficulties, to seek the great commercial cities of their day. The city was filled with individuals from the various countries around the Mediterranean, who were well posted on science, art and manufactures. Picture to yourself a humdrum countryman in Athens for a day or two. Must he not have been astonished at the quickness of mind of all about him — at the extent and precision of knowledge among sailors, soldiers, merchants and philosophers? Again, a few years later we find a similar set of circumstances producing the same result. Carthage arose like a queen from the sea; her towers and palaces were spoken of by the ancients only in terms of deepest wonderment. Again, Rome rose in all her magnificence, and drew the choicest men and materials from the entire world; rare gems, colors in purple and fine linen, a manuscript of the past; but, above all, in her streets were found the subtle-minded Greek, the Gaul of scientific turn, and the sweetest poets of all countries.

To-day we have this conglomeration of men who make up our great West. More than the Athenians, the Carthagenians or the Romans, do we feel a spirit of enterprise; in a greater degree do we draw to our centres the thinkers of all countries. Here come determined, bold spirits, who, filled with ambitious dreams, have left their older homes in Germany, France, Italy, England, in the Orient, and in the older States of our own country, all imbued with the same restless activity, the same readiness to give up the old when the new is better, the same fearless examination of everything laid before them.

We are without doubt all, in a certain sense, adventurers. Each man brings some knowledge peculiar to the land of his birth. Each one has the disposition to look upon things in accordance with the nature of his blood and the education of his province, and the community as a whole is thus constantly enriched with the thought of this steady stream of keen, incisive, thoroughly living men.

If we recognize this fact, and all of us determine to make the most of it, we must show a progress that will surpass anything which has gone before. In short, we possess the whole past in a living form, ready to actively assist each and all of us in the struggle to eliminate crudities and to secure what is in accordance with the unchanging laws. No man among us can possibly possess more than a fragment of the knowledge of all, and if we would do the best with our lives we must do the best for the community and the times we live in. This can be brought about by each one acknowledging his shortcomings and being willing to frankly and kindly accept the help of others, and still more, to give it in the same spirit himself. If there is a man amongst us who has an ambition to leave an honorable name — and I hope this is true of every individual — he may be sure he will fail of his object if he works for himself alone. There are many things, undoubtedly, which will come up for discussion in the convention, which are peculiarly its province. I will therefore only mention a few, as, for instance, the schedule of fees, the code of professional ethics, and that frequent source of trouble, competitions. Remember that our science is a union of all sciences, and this to a degree that cannot be said of any other profession, and that the great man is both a theorist and at the same time thoroughly practical; that we should be ingenious and apt to learn.

Recognizing this, it is hoped that an impetus will be given here which will carry us on to success and make our work better. It is not to be hoped, perhaps, that the name of each shall go down to posterity, but it may be hoped that the united efforts of us all will leave impressions which shall stamp a pure American spirit on the ages to follow.

Shall we teach the lesson of united effort in an honest, manly cause? The famous scientist whose philosophy crowns the thought of this century said, in his few words of warning to Americans: "The duration of your institutions will depend, not on your education, but upon your character." Does not every one of us see that it is so, and hope with Spencer that the blood of our hearts may warm us toward the common good, and the thought of our brains be toward the accomplishment of our work as a whole, and not primarily toward the fleeting success of the individual, be it in finances or in popularity.

A Committee was appointed to frame a Constitution and By-Laws, with instructions to report the following morning.

A Committee was appointed to draft resolutions in the matter of fees and competitions.

The *Inland Architect and Builder* was appointed the official organ of the Association.

The afternoon was spent in visiting points of interest.

In the evening the Chicago architects entertained their brethren at a banquet, given at the Grand Pacific, as a pleasant termination to the convention, and in honor of the formation of a new association.

The first toast of the evening "The New Organization," was responded to by Mr. John C. Cochran, of Chicago, as follows: —

Mr. President and Brother Architects: — I think I can truly say that this is the proudest day of my life. I regard this compliment to respond

to the first toast as the greatest that I have ever received. The notification came rather late this evening, and I have prepared no speech and I hardly know what to say. I have jotted down some heads of ideas as I came here that struck me as proper to bring out on this occasion; and to premise I would say that I feel very proud to welcome this body of architects, not only of architects, but of representative men, for of all men in the world of any profession I regard the architect as a representative man. I feel proud to recognize such a handsome body of men. I refer to Mr. Hodgson. I have been wondering why I have been called upon; I think I see the reason. Knowing that I couldn't make a speech, they had a scheme here — others would follow me and would so easily eclipse me. That is the only solution that I can assign. But the sentiment of our organization is a grand sentiment—the Western Association of Architects — and I, having been in the West so long, have felt very much the want of such an association. I have felt very much the want of the sociability which this has brought out. I have felt very much the want of the support it gives in the performance of my duties as architect, the advice it affords; and this I hope is the commencement of an association that will last forever. I am surprised this evening to see so many architects here. It did seem to me, as we came filing in here this evening, that our western country was even larger than we had thought it, and I hope this Association will not be short-lived, and that it will be of great aid to us in our profession in every way.

Secondly, the teaching of this Association. This Association should be the means of teaching us not only in our professional duties, but in our duties as men, as honest men. For if any man should be honest it is the architect; for how many men trust their all to the architect in the preparation of plans for the erection of a home!

In the next place what shall constitute an architect worthy to be a Fellow of this institution? To begin with, he should be a scholar, versed in mathematics; he should be an artist; he should be a skilled business man. He should be a lawyer in one sense, for I know myself that usually an architect can make a better contract than any lawyer, because he understands all the points that need to be brought out in a contract. A member of this Association should be a gentleman; to be a member of this Association should be an entrée into society — it should be his all-sufficient credentials of manners.

Next I would say that the Association should be for the advancement of knowledge and for the instruction of its members. It should have its annual conventions, as you propose. At these conventions, lectures should be given and papers read.

And the next thing I would suggest would be the establishment of schools; not permanent ones, but annual schools, to meet say for one week each year, and at these schools the instruction should be practical and up to the times; papers by the best talent should be read to young men, and lectures should be given. And when young men attending these schools for a certain length of time can pass an examination by its board of directors or a committee appointed to examine them, they should have a certificate to practise.

The next thing I would suggest would be a library. I think that the Association should have such a feature at headquarters, and I would suggest that a library be started and books and papers collected where every member of the Association can have an opportunity to examine them. Also an art-gallery. If every architect here would give a picture, what a gallery we could furnish. To me it would be full of interest. I think we could have one of the largest art galleries in the United States in a very short time. Our friend, Henry Lord Gay, who has established an exhibit here, has set a good example, and a few of us have contributed a few designs there for the edification of our visiting friends.

The next is fees and competition. Here is a very delicate matter to touch, and I would say to the Association that it must go slow in this regard, because I am of opinion that whatever fee we establish, whatever percentage, every member of the Association must live up to it, or else get out. For myself, I have always maintained a fee that would satisfy the *American Architect*, and I believe I stand by it to-day, and I want to say for the edification of younger brethren that it is better in the end than to cut rates.

I suppose the visiting architects have enjoyed the afternoon in visiting the buildings, boulevards, etc., and to them I want to say one thing in reference to the officers of this institution. We have had heretofore a Chapter of the American Institute of Architects; we have tried to carry that along, but it has been a perfect failure — a perfect failure— and I have rejected it as detrimental to the architectural profession; for this reason, that the majority of our architects did not attend. I attributed that to the fact that the American Institute of Architects really seems to be an Eastern institution. I feel that we have not been treated fairly in the West. I feel that we have not been represented in the West, and I don't blame the American Institute of Architects, for they have been a head centre of architecture in this country.

I would recommend, in electing officers, that we old fellows stand behind and elect young men — ambitious men, who can give time to the cause; especially the Secretary, who needs to be a live man, who will attend to the duties involved. In reference to the location of the officers, the Convention will have to decide. I have heard several opinions on that subject.

The second toast was "Architectural Literature," response by R. C. McLean, of the *Inland Architect*, of Chicago, who said that one of the earliest Inland Architects and Builders was the beaver, who was followed quickly by the Indian; then by the pioneer with the log hut; then the shingle palace, and finally such ten-story fire-proof costly structures as are to be seen to-day in progress in the immediate vicinity of this banquet-hall, etc. An interesting address, which we regret has not yet been fully reported.

The third toast was "The American Institute of Architects," the response to which, by Mr. W. L. B. Jenney, of Chicago, was published in our last issue.

Among other toasts was "The Dwelling," response by John W. Root, of Chicago. Of this very interesting speech we can give but an outline.

Of the earliest dwellings no records exist. We have no knowledge of the plans and style of the house in which our first parents lived, when they were raising Cain, but we feel sure that the element of *Madame* in the planing of the dwelling is of very modern introduction.

The architect at work is startled by the rustling of silk, and the odors of sweet scents. A lady enters, unfolds a sheet of delicately-tinted gilt-edged paper, and displays a plan; just what she desires for her house.

There are large numbers of closets, and many rooms; figured usually about 25 feet square. A space 18 inches by 4 feet is devoted to the stairs.

There are to be towers and turrets, bay-windows, loggias, verandas, stone steps, hard-wood floors, fine mantles, a grand staircase, timber ceilings, recessed sideboards, and cabinets, stained-glass, etc.

The cost of all this magnificence is to be $4,000. The lot 25 feet wide, the plan called for 63 feet, etc. The architect condenses, cuts down, omits, and after long labor produces a house, but a small part of what was wanted, and yet to cost much beyond the $4,000.

The poor architect is of course to blame for exceeding the instructions as to cost, and for not giving *Madame* the half she told him she must have.

Mr. Root's description of the modern architect's struggles with *Madame*, his female client, were exceedingly amusing, and kept the audience in an uproar.

The other toasts were "The Office," "The Store," "Fees and Clients," responses respectively, by W. D. Falls, Chas. R. Ramsey, St. Louis, and C. H. Lee.

At midnight the party dispersed, to re-assemble Friday morning for the completion of some unfinished business. The most important being the report of the Committee on Fees and Competition, John P. Root, Chairman; and Messrs. Charles H. Lee, E. O. Fallis, and Charles K. Ramsey, the report reading as follows: —

Resolved, That in his relation to clients and contractors, the architect should be an impartial arbitrator; and under no circumstances should he act as a special pleader for either party.

Resolved, That the relations between architects and clients should be confidential, and that no architect is worthy of employment who is unworthy of trust.

Resolved, That it is the sense of this Association that the architect should in all cases superintend the work designed by him.

Resolved, That in cases where for special reason the architect does not superintend the work designed by him his responsibility ceases with the delivery and acceptance of the plans, unless by expert testimony it can be proved that the plans were defective.

Resolved, That the President, Secretary, and Treasurer of this Association constitute a board of arbitration, whose duty it shall be to adjust all questions in dispute between members of this Association and their clients which shall be submitted to this board.

Recognizing the desirability of uniformity throughout the country in the matter of fees, and having implicit confidence in the action of the American Institute of Architects in this respect.

Resolved, That this Association adopt the schedule of fees recently adopted by the American Institute, and that the Secretary of this Association mail to each member a printed copy of this schedule as soon as practicable.

Resolved, That no architect should enter a competition for any building or other work, unless the decision of the competition shall be made by recognized experts.

Which after long discussion was adopted.

A permanent committee was then appointed to draft a By-Law on the subject, the same to be printed, and a copy sent to each member. Action to be taken at next annual meeting.

The Convention concluded its session by the election of the officers of the Western Association of Architects for the ensuing year, as follows: —

President: C. E. Illsley, of St. Louis; *Secretary:* Henry Lord Gay, of Chicago; *Treasurer:* D. Adler, of Chicago.

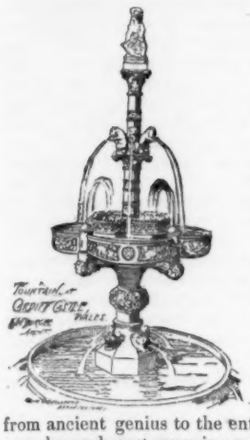
Mr. Illsley spoke a few words of thanks: —

Gentlemen of the Convention: — My friend, Mr. Ramsey, told me to have a speech ready, but I did n't really think there would be a chance for it, and I thought it would be spoiled if I got it ready. I would n't be so egotistic as to think that this is an honor tendered to me, but with your permission I will take it as a compliment to St. Louis. I used to be in Chicago, and I will consider myself as a sort of connecting link between the two cities. When I come up to Chicago I think the time not distant, if indeed it has not already arrived, when the great glory of this lake will be, not in its size, but because Chicago is on it. Now we hope the time will come, after a while, when it will be said of the Mississippi, not merely that it is the longest river on the globe, or the greatest river, if you please, as the chief thing said about it; but that it is the river on which St. Louis stands. Gentlemen, one of the principal things, after all, that make a city is the quality of the buildings which its architects put up. That is the thing above all others that draws me up to Chicago every time I can get here. Now, when you come down to St. Louis, we expect to get the benefit of a good deal of the inspiration that we have received from you here, and that will give us great help in our work of making St. Louis the great city we expect it to be. I have no speech ready to make. I thank you in the name of St. Louis for this honor.

The meeting adjourned to meet one year hence in St. Louis.

The Convention was an undoubted success; the attendance was not less than one hundred and fifty architects, probably more. The utmost harmony and good fellowship existed throughout, the members of the Institute and others exerted themselves whenever the opportunity offered to obtain an expression of good feeling, and the hope was expressed that sooner or later some method might be arranged, whereby the new local Association could be united to the National one. Such expressions were always well received, and we may hope that this Convention will result favorably to the profession.

ON THE STATUE OF BACCHUS RECENTLY DISCOVERED AT THE VILLA OF HADRIAN.



THE excavations which have been prosecuted at Rome, within the walls, since it became the capital of united Italy, and which have so entirely transformed the aspect of several localities which many of us love to recall as we knew them in the days of many an abolished abuse, have yielded much interesting topographical knowledge, inscriptions historically valuable, and a certain number of works of art. None of these last, however, take very high rank. The lover of ancient art for its intrinsic beauty does not care to be put off with simple information, however valuable; he watches proceedings with the eager hope that sooner or later he may hail the recovery of one more work of sculpture which he may recognize as a permanent bequest from ancient genius to the entire world. Such a hope was gratified even beyond most sanguine expectation, when the explorers of Olympia exhumed the Hermes with infant Bacchus of the Heræum, a work of such consummate excellence as to challenge assent to the strong presumptive evidence that we possess in it an authenticated original by one of the most renowned sculptors of antiquity. In this respect this work of Praxiteles places him before the modern world as no other ancient artist is placed except Phidias, a still greater name, by the sculptures of the Parthenon. Neither the recovered sculptures of the Mausoleum, nor the pedimental compositions of Olympia are such as to strongly assert their connection with such great names as their reputed authors, Scopas or Alcamenes; and it is perhaps, in some respects, as well that critics should sometimes have to appreciate works of art in compelled freedom from the bias of doubtful inscriptions. Such are the circumstances under which we are called to welcome the statue which is the subject of the present notice. It is an admirable and well-preserved statue of Bacchus (Dionysus), discovered in 1881 on a site which has been rich in such treasures: the villa of Hadrian, close to Tivoli. German archæologists of course will not be balked of a right to conjecture, to dogmatize, as to its school and its date; but even their adventurous self-confidence does not pretend to be able to give even a guess as to the name of its author.

The statue may be truly described as well-preserved, though in fact it was found under a flight of stairs, broken into several pieces. When fully set up, it appeared only to have lost the right forearm, with the hand, and some attribute which broken attachments show that it held. The finely-wrought surface is unimpaired, the delicate features are perfect, and the left arm, which hangs free, is perfect even to the tips of the free, and easily and naturally curving fingers. The height is given as 1.77 metres, equivalent to five feet nine inches, and having regard to the attitude and the age represented, which is that of earliest developed manhood, it may be considered as fully life-size. It stands upon an oval basis with Attic mouldings, which is not larger than will just accommodate it with the tree-stump which is attached to the right leg and secures the figure from breaking by its own weight. It is remarkable that in a work of such complete finish the sculptor should have not cared to clear away a few of the small knobs or prominences which bear the marks of having been employed in the "pointing off" of the statue from the original model. Four of these are observable in symmetrical positions about the hair and one on the leg. These might almost seem to be left as deprecatory hints that the artist had not finally wrought out his idea, in the same modest sense which was implied in the use of the imperfect tense upon inscribed works — not "Glycon made it," but "Glycon was making (that is, was engaged in making) it." Michael Angelo left a few square inches of the flesh of even the elaborately-finished "Moses" unsmoothed, perhaps in the same spirit, though indeed the appropriate inscription on many of his works would have been, not that he was making, but that he was beginning them; so much is left so merely and roughly blocked out.

Our statue is the subject of a detailed dissertation by Professor Michaelis of Strasburg, in the last report of the Archæological Institute of Rome, with illustrations from photographs of a cast of the statue in four aspects. These are taken from the front and back, from the right side and left, and so far enable us to appreciate its leading characteristics. It is only unfortunate that they were not taken with more sensitive adjustment to exactly the points of view which the sculptor chiefly valued, and that has only been hit in one case accidentally.

At the first glance the spectator is struck with the peculiar union of feminine and masculine character in the treatment of the flesh and forms, still more expressively than in the abundance and arrangement of the hair. The figure is by no means of the class that has been styled *androgynous*, or even hermaphrodite. It is neither a man-woman nor a womanish man, but a special creation to which either sex is contributory of some suggestions, with a result which is as remote from a purely effeminate as from an Amazonian type. So it is that it is known at once that we have before us a Bacchus, a Dionysus, the god upon whom the ancient poets and mythologists, both Latin and Greek, exhaust their invention in phrases and epithets expressive of a combination of attributes in mind and person borrowed from both sexes. It is probable, from the position of an attachment, that the right hand held a cantharus; but quite as decisive is the nebris or fawn-skin which, knotted over his right shoulder, clings to him, scarf-like, the skin of the legs, weighted with the hoofs, hanging down vertically in front. This is a frequent attribute of the Dionysiac company of fauns and satyrs; but that it is no faun, but the god himself, whom we have before us, appears by the absence of the pointed ears or fantastic tail, as well as by dignity of expression.

The god rests upon his right leg; the left is retired and slightly bent, the foot easily touching the ground with its ball. His head is gracefully declined, and turned as if attentive to the action of his bent right arm or to the object which he is holding. The action is thus as slightly demonstrative as can be conceived; it is sufficiently so to inform the attitude with a sentiment of definite purpose, while still it leaves the effect which the artist aimed at realizing, to be gathered from the general expression of the special typical conception. The nearest parallel to this ideal in collections of ancient art appears to be a torso which is restored as an entire statue in the Vatican. The enthusiastic description of this by the great connoisseur, Visconti, might be taken to be derived from our statue. The smoothness and softness of female forms is united with more liberal mass than is feminine; the neck has nothing of the usual masculine configuration; the hair has a central parting; a few delicate locks escape by the temples, but otherwise it is rolled over luxuriantly on either side, and carried behind to fall down the back, where the full fillets are tied together by a band, leaving the ends to unite in a thick bush. It is observed that the parting in front is not central to the forehead and line of nose; such is the case, also, with the hair of the Venus of Melos. It is one of the studied irregularities which the ancient sculptors admitted, that tell even when and partly because not distinctly observed, to keep in check an appearance of unnatural formality. We may trace such a stratagem in the variation of the sides even of their youthful and beautiful faces; in more developed and in aged head, as, for example, in that of the Townley Homer, the diversity at once declares itself, and yet is so managed as to enhance expression.

There is more diversity in the types of Dionysus that have come down to us in sculpture than of any other god or goddess of the Hellenic Pantheon. He is represented of all ages, from infancy to youth, mature manhood, and as a bearded senior, entirely nude or heavily draped. It is only in his followers that the abuse of his gift of wine becomes grotesque or degrading. The mythology connected with Dionysus had a serious side in his relation to the most venerated of Greek mysteries, and this preserved the dignity of even the livelier phases of the wine-god's nature. Sportiveness and exhilaration blend away under his influence into consolatory cheerfulness, into enthusiastic religious elevation and excitement; so it is that the magnificent bronze bust which was recovered from Herculaneum was claimed by the less instructed archæologists as Plato, was admitted by more as, if not Plato, worthy to be Plato, and is even circulated by photography in connection with a still higher name. It is in the peculiar manner in which legend associated Dionysus with outbursts of religious fervor among women that the true significance is found of the blending of feminine characteristics in such an idealized representation as the statue now under consideration. The head of the youthful Dionysus in the museum of the Capitol at Rome long passed for feminine, was now named a Leucothea and now an Ariadne, till a more sharp-sighted and erudite critic drew attention to the decisive indications of sprouting horns under the tresses, and attached the descriptive line of Ovid: "apart from your appearance with horns your head might be a virgin's."

Professor Michaelis objects that the strengthening tree-stump which is attached to the right leg and hip of the statue, is so introduced as to interfere injuriously with the lines of the figure, from one point of view especially. The complaint proceeds upon a mistaken assumption. The proper inference is that the aspect in question is one which the sculptor was desirous should not be rested in. There is no greater mistake than the supposition that the ancient sculptors of statues in the round intended their figures to produce a fine effect from whatever side they could be seen. True it is that in some instances they do succeed in realizing fine effects from very numerous points of view; but even so it is found that one or two have been considered and favored preferentially; other instances may be cited — the Venus of the Capitol is one — where for the sake of a supreme effect from a single point of view, all others are sacrificed without compunction. Had this been duly considered, the present statue of Dionysus would not have been photographed for a front view in quite such a random way. As it is presented, there is an offensive parallelism of the hanging fawn-skin, the tree-stump and the statue's leg. This should have been taken at once as the sculptor's warning to turn the figure somewhat round towards its right, when the stump would be partially obscured and otherwise would give contrast to the line of the leg, while the outline from above the hip downwards would have given that clear and decisive outline in the contemplation of which ever resides so much of the delight of admirable sculpture.

There are some other points in the Professor's criticism to which objection might be taken; but let this at present suffice. This latest statue recovered from the ruins of an empire, from the catastrophe of

an entire system of civilization, is one of such distinguished merit as to claim to be represented by a cast in all the art museums of both worlds. Professor Michaelis has a further objection to make to the effect that the sculptor has not succeeded in a perfect fusion of the characteristics of the sexes, such as the poetic ideal assumes; it appears to him that the masculine and feminine qualities are rather juxtaposed than combined, the masculine being predominant in some parts, the feminine in others. We will assume that the problem of complete homogeneousness of effect under the conditions, difficult as they are, is not impossible; it will still remain a question, having regard to some other ancient works, whether the artist really aimed at it. This was far from being always the case. Perfect homogeneousness of type is as certainly aimed at as admirably achieved in many of the great statues of antiquity; it is the rule in the Parthenon statues, and among works of later date, from the Hermes, the faun, and the Apollo Saurectonus of Praxiteles, to the Farnese Hercules and the Apollo Belvidere, self-consistency, pure and simple and single, is the governing norm. But this self-contained unity of expression and systematic coherence made a great demand upon powers of originality and imagination; with the less endowed there was a liability to lapse into tameness and monotony when a novel experiment was tried, or into the mere mannerism of imitation, which was as little capable of exciting interest. The temptation was then inevitable to try the stimulant effect of more declared contrasts. In the various copies of the Discobolus of Myron and in the athletic Apollo — the Choiseul Gouffier Apollo — of the British Museum, we have types of athletes who are athletes every inch, and athletes of special and simple type; but when we turn to the Strigil-user of the Vatican, we shall be likely, if we frankly admit our impressions to ourselves, to be startled by a sense that the lower limbs are distinctly out of proportion or out of character. A similar contrast is presented by the Venus de Medici; here, however, it is more skilfully qualified or veiled, and it is by no means at a first glance that we are struck by the fact that the proportions of the lower figure are by no means such as we should have independently inferred from those of the fully developed shoulders and bust.

Distinctive character of any kind is of course given in art by special associations of qualities which are in their nature different, and may, if uncontrolled, be antagonistic; it is the function of poetic imagination, as of artistic genius, to determine and realize the precise adjustments which will conciliate wild tendencies and reduce them to a harmony. It is thus that they are pressed into co-operation for compassing effects unattainable by either alone; and thus it is that the union becomes characteristic and expressive of character. But all depends, as will be seen, on the aptness and perfectness of combination. Contrast is essential to art, but harsh contrast, which is painful discord, is destructive of it. The question of success or failure at last depends, as in all other arts so in sculpture, upon whether contrast of associated qualities is so treated as to heighten sentiment, or whether it is subservient chiefly to the excitement of a startling effect, a vulgar surprise, and so becomes degraded from refined sentiment to coarse sensation. W. Watkiss Lloyd.

A NEW-MEXICAN PUEBLO.

THE Pueblo of Acoma, situated ninety miles west of Alberquerque, is one of the most remarkable communities in New Mexico or the United States, To reach it, take the Atlantic & Pacific Railroad to McCarthy Station, and then transfer to an Indian pony and ride eighteen miles south-by-east. When near your journey's end you descend almost imperceptibly into the valley, six miles in width, in the middle of which stands a butte, and on the top of this is Acoma. Eight hundred people are living there, and they and their ancestors have gathered there the sum of their possessions for nearly three centuries. This butte is one of many that are the remnants of a mesa that has been worn away by the erosion of the ages and survives only in flat-topped mountains here and there. The valleys between are fertile, and untold generations of men have seen them covered with waving grain and flocks of sheep.

Some time in the seventeenth century, the Laguno or valley Indians made war upon the Acomas, for the possession of the country, and the latter, being the weaker, occupied this butte as a defensive position believed to be impregnable. Their judgment has been abundantly vindicated. It has proved a Gibraltar of strength and safety. The comparison is not inappropriate, and in approaching it from the north I was struck with the resemblance to the pictures I have seen of that grim fortress that frowns over the Straits to the Mediterranean. The height above the valley is nearly four hundred feet, and the walls in several places nearly perpendicular. There are two means of ascent; one by a flight of steps cut into the face of the wall and rising at an angle of forty-five degrees, and the other by a fissure in the rocks leading up into the heart of the mountain. Both ways have been trodden by human feet until the steps are hollowed out like shallow troughs. Either one is exceedingly difficult, and neither is tolerably safe. We chose the one along the fissure. To give an idea of the laboriousness of the task, imagine a stairway starting at Mr. Grosvenor's office and rising to the top of the spire of the Methodist church, then continuing on an easier angle for one hundred feet, and then rising again by a steeper grade than ever to an elevation higher than the weather-vane on the university, and this stairway a precarious footing along the sides of a gash in a rugged mountain, and you may know how we reached Acoma! With all the danger and fatigue, it is a laughable sight to see a person — some other person — make the ascent. One has to stride over the fissure, one foot on the right-hand side and the other on the left, and at the same time press the hands alternately against the rocks for support. An Indian will throw a live sheep around his neck, and go up quite rapidly without touching either hand to the rocks; but I am satisfied I could never do it.

They told us of a pathetic incident that occurred on the outer stairway several generations ago. Several men started up, each with a sheep on his back. When nearly to the top, the sheep carried by the foremost man became restless, and the shepherd, in trying to hold it fast, lost his footing and in falling swept his companions over the precipice, and they all fell on the rocks at the foot in a lifeless heap. The Indians have carved a representation of the accident on a rock near where it occurred, which scarcely serves to steady the nerves of those who go by that route.

The top of the elevation is level and contains an area of sixty or seventy acres. At one side stands the pueblo, a blunt pyramid of adobe and stone honeycombed with rooms, at the other the church and graveyard, and near the centre a pond of pure water thirty feet in depth and several rods in extent.

The priest was made acquainted with the object of our visit, and the ringing of the church-bells brought the inhabitants of the village around us. When they understood that the title to their lands was in question and we had come to take testimony, they showed great interest, and discussed the various points involved with remarkable intelligence, considering their limited opportunities for a knowledge of law. As nightfall came on, a number of the men who had been at work in the valley came up, bringing delicious peaches and grapes, which we were glad to accept in view of the meagre preparations for supper. We slept in the church, wrapped up in our Navajo blankets, and never felt more secure or happier in our lives. When the gray dawn peered through the little mica window-panes, it revealed great roof-beams more than a foot in diameter and thirty or forty feet long, and through the open tower a bell that was cast in 1710. How these immense timbers and this bell were brought up to the top of this cliff no one living knows. The Indians shake their heads and the priest shakes his, but no one ventures an opinion. The timbers are there, however, as witnesses, and morning and night, as the seasons come and go and generations pass away, the bell speaks for itself in the silvery tones that pleased its founder in far-off Spain when King George was on the throne. The adobes — or the earth of which they were made — were brought up from the valley, also, for the top of the butte was a bald rock in the beginning. And the earth for the graves came the same way, requiring forty years, the priest said, to complete the graveyard. It is the only completed graveyard I have ever seen. The old priest seemed very happy in the charge of his flock, and his flock seemed happy in possession of him.

When the time for our departure came, there was hand-shaking and a gracious blessing from the old man, and a message to Father De Fouri, and we climbed down from the city in the air and rode back in silence to the railroad.— *Lawrence, (Kans.) Journal.*

THE ILLUSTRATIONS.

THE CITY THEATRE, BROCKTON, MASS. MR. J. A. FOX, ARCHITECT, BOSTON, MASS.

IN planning this theatre, care has been bestowed rather on its structural elements than on its decorative features, and attention has been chiefly turned, perhaps, to making it fire-resisting. The several departments of the building, the stage, the dressing-rooms, the auditorium, the lobbies and the passages are all enclosed by and separated from one another by stout, brick walls. The proscenium wall has but two openings in it, the stage opening and one small door, and the decorative features about the proscenium arch are of galvanized-iron. The stairs have wooden treads, pugged between the carriages with mortar, and the soffits plastered in three-coat work on wire lathing. The doors are all metal-covered, sometimes with an ornamental covering outside of the metal-work, and swing outward. The entire building is lighted by the Edison electric lamps, supplied from a central station in the city; the lights in the passages and lobbies being independent of all others. All floors are protected by asbestos felting between upper and lower boarding, and whatever could be done to ensure safety from fire, without incurring excessive expense, has been done. Besides these things, the stage is supplied with standpipes, hydrants, and hose connected with the city water-supply, and portable fire-extinguishers are distributed through the building. Safety is still further assured by placing the steam-boilers outside of the theatre-building, and the heating of each department of the building is independent of the others.

The whole cellar under the auditorium is covered overhead by a network or gridiron of steam-pipes, and the fresh air taken in at the rear of the lobbies circulates over them and enters through openings left in the upright risers of every seat-step, thus distributing the heat where it will be of most service and avoiding draughts. This system is supplemented by radiators placed against the exposed north wall on Ward Street side and under the north proscenium-box. The lobbies

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Young Men's Christian Association Building
Boston, Mass.
Messrs. Rand & Taylor and Bridgham & Metcalf, Architects
Interior
Ed. Wales & Boyden Lith.
Heliotype Printing Co. Boston

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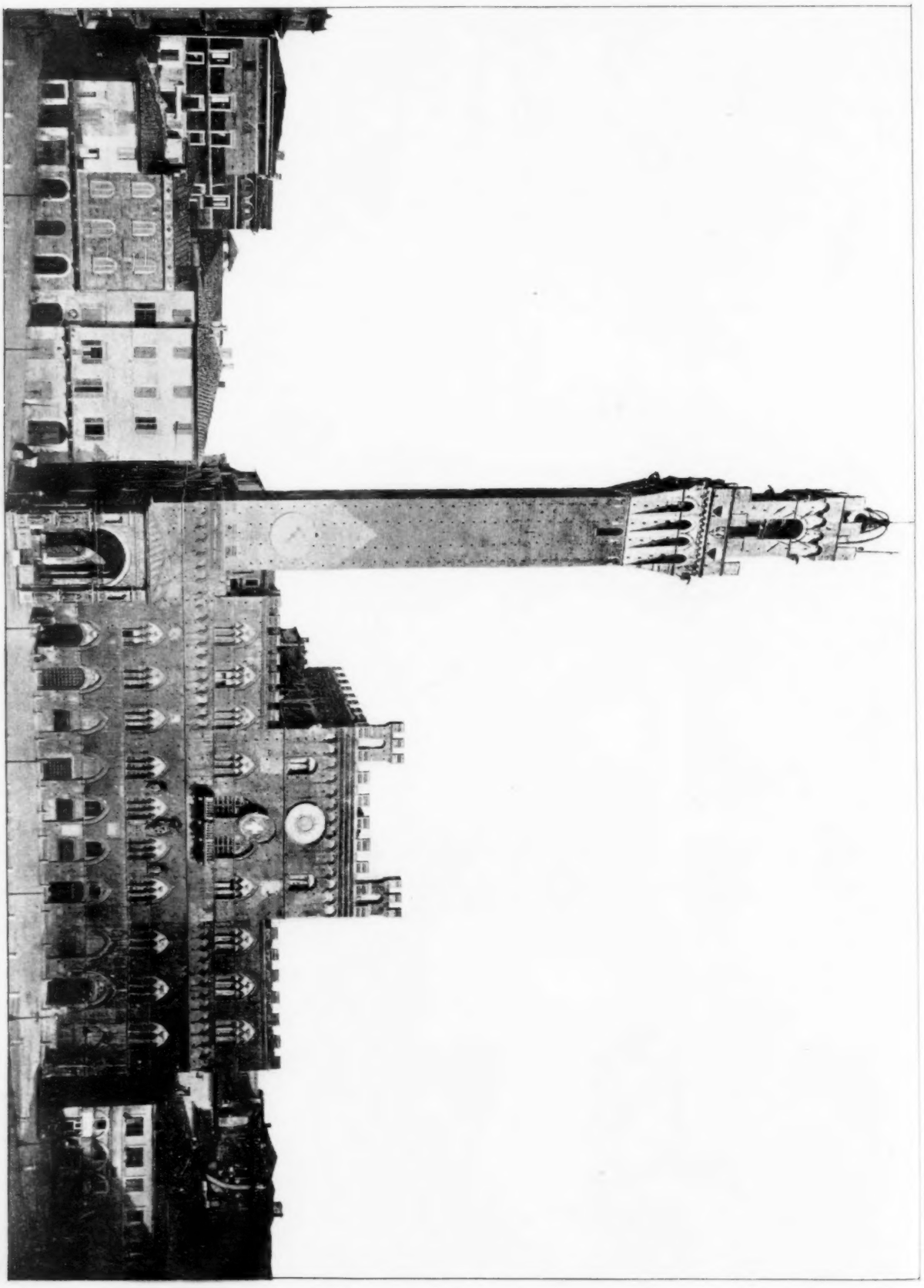

PIAZZA DEL CAMPO, SIENA, ITALY.

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No. 466 American Architect and Building News, Nov. 29 1884

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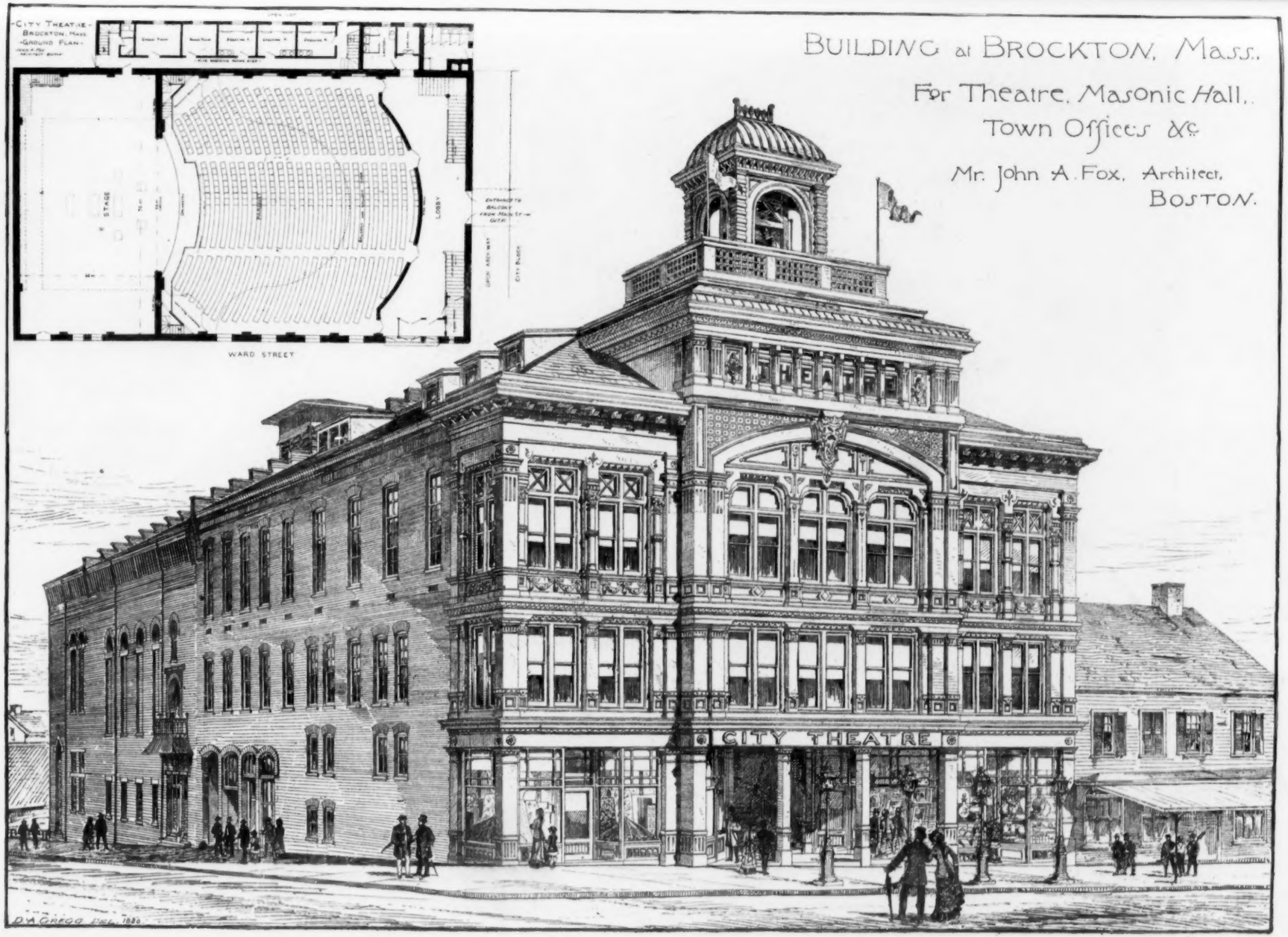
BUILDING at BROCKTON, Mass.

For Theatre, Masonic Hall, Town Offices &c

Mr. John A. Fox, Architect, BOSTON.



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Building of the Young Men's Christian Association, Boston, Mass.

STURGIS & BRIGHAM, Architects.

BUILDING AT BROCKTON, MASS.

American Architect and Building News, Nov. 29 1884 No. 466

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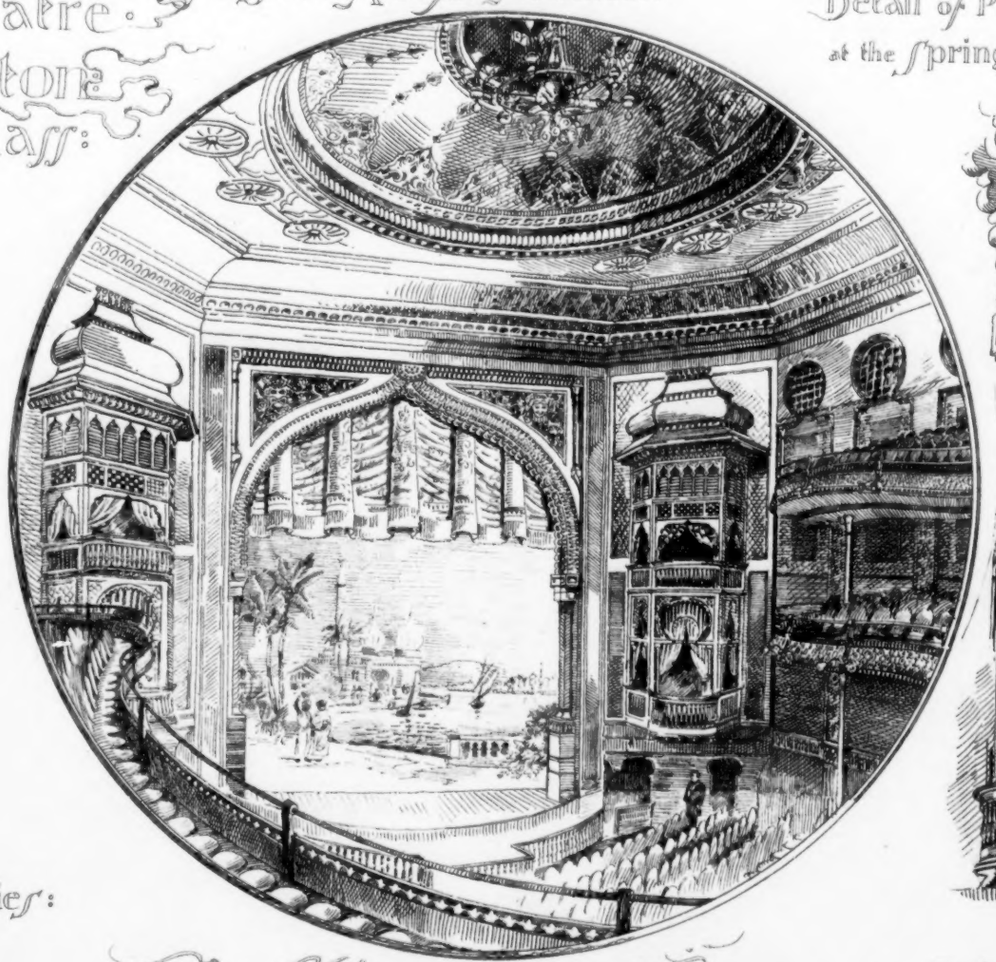
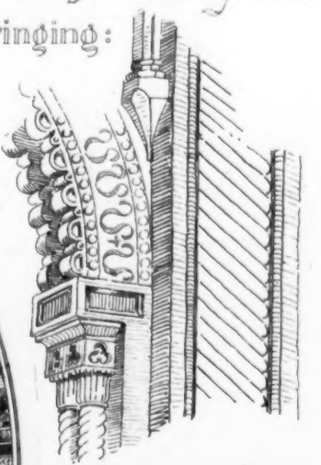
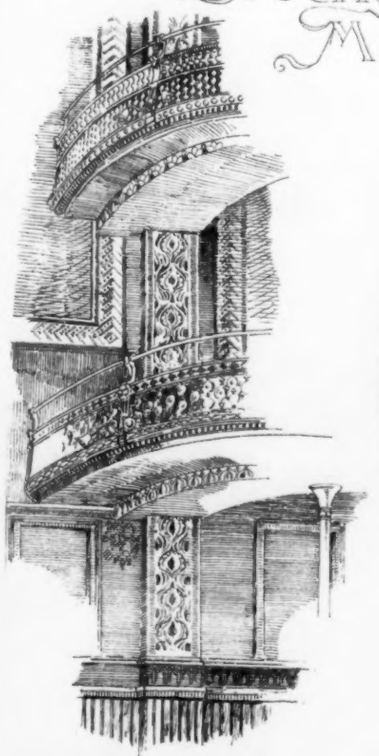
Sketches of the new "City Theatre" Brockton Mass:

Mr: John A: Fox: Architect:

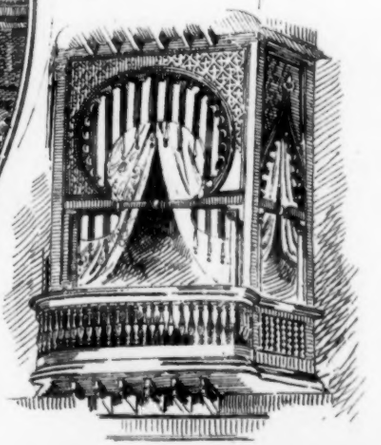


Detail of Proscenium Arch: at the Springing:





Detail Sketch of Balconies:



Detail: Sketch of Lower Boxes:

An "Interior" Sketch from Balcony:

E. Elson Deane.

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THE CATHEDRAL, FLORENCE, ITALY.

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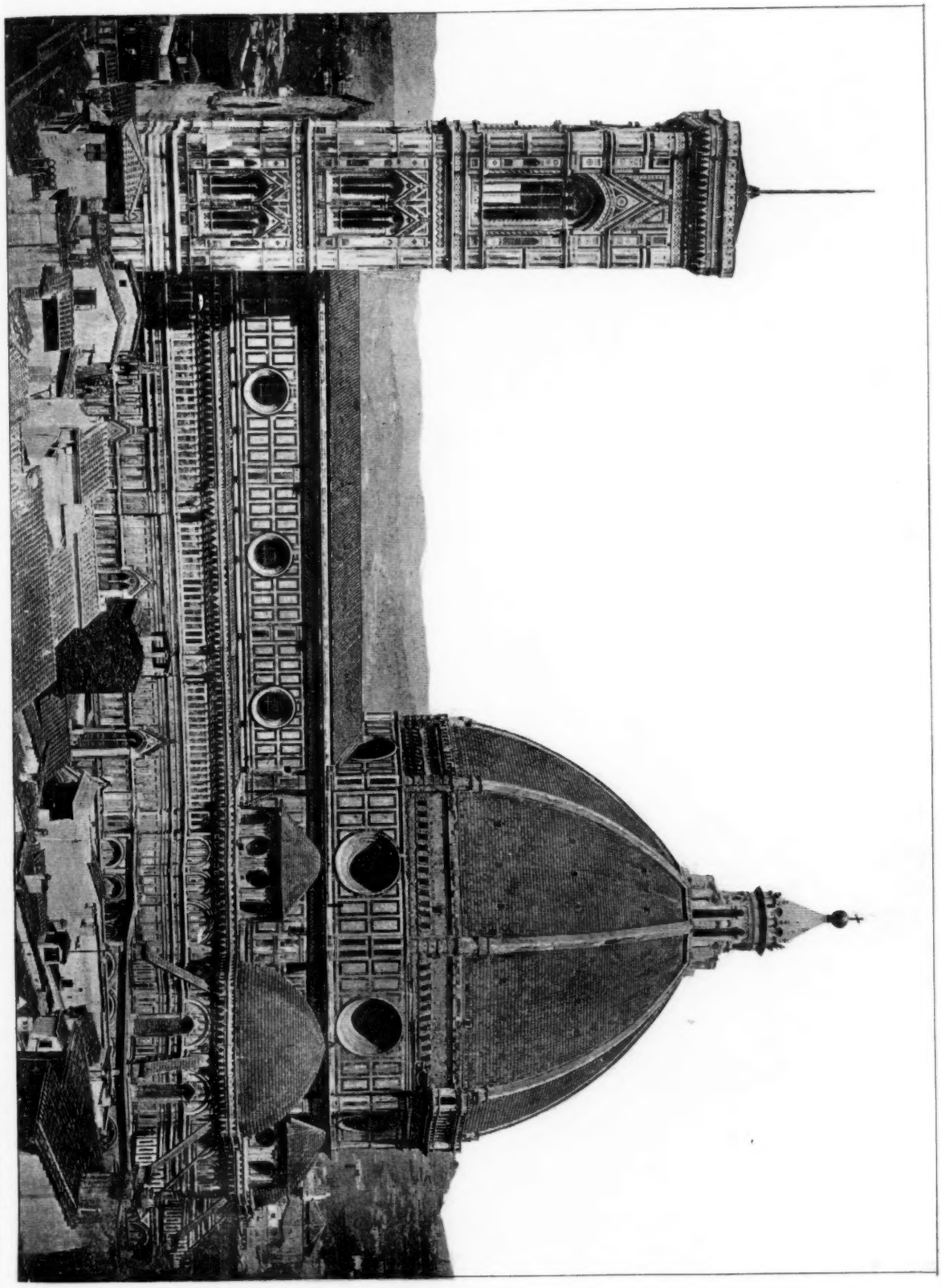

THE CATHEDRAL, FLORENCE, ITALY.

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TOWER OF THE CHURCH OF HAUTE ALLEMAGNE NEAR CAEN.

BOYS' LODGING HOUSE AND SCHOOLS – SEVENTH AV. – N.Y.
FOR THE NEW YORK CHILDRENS' AID SOCIETY – VAUX & RADFORD ARCHTS.

HELIOTYPE PRINTING CO BOSTON

and lavatories are heated by direct radiators, placed to intercept and temper all incoming currents of cold air. The main foul-air outlet is the large louvre ventilator, placed in the flat roof directly over the eye of the dome. This is extended down to the dome lantern by a tight shaft, which is connected under the roof with three smaller shafts, carried to perforated ceiling-ventilators in the rear of the gallery ceiling, and these again draw through openings in the seat-steps and ventilating openings under the balcony directly from the dead air under the latter and in rear of the parquet. These ventilators and also the dome lantern are of perforated iron plate, in decorative patterns. An upward current is created in the main shaft by coils of steam-pipe and stacks of cast-iron radiators, which are intended for use for this purpose both in summer and winter.

A study of the plan will reveal most of the features of the arrangement, while the sketches of the interior serve to show the eclectic character of the architecture of the building. The general tone of the interior color is more "on the yellow" than anything.

The auditorium has a depth, from curtain-wall to lobby, of sixty-eight feet, and a width from wall to wall of seventy feet and four inches. The full height from the lowest part of the parquet floor to the eye of the dome is fifty-one feet. The parquet has twenty-four rows of seats, the balcony seven rows, and the gallery six rows. The pitch of the parquet is rather steeper than common, and the height of the stage front lower, to suit the level floor of the stage.

Each level of the auditorium is backed by a lobby sufficiently large to give standing room for all the occupants of seats in that division. These lobbies are separated from the auditorium by self-closing doors, and each of the three has ample cloak and coat rooms and lavatories. Two broad and heavily-built staircases, with rails on both sides throughout, lead from the gallery and balcony to the street level, and the balcony section has a direct exit through City Block to Main Street. The parquet lobby has, in addition to its principal exit on Ward Street, another to the arched passage under the rear of City Block, and opening at one end on Ward Street and the other on an open yard. Besides these regular exits there are outer doors and stairs from the balcony and gallery lavatories to the flat roof of the dressing-room annex, and glass doors to an open wrought-iron balcony on Ward Street.

The great arch has a height from the stage to the crown of thirty-six feet, and a clear span of thirty-nine feet and four inches.

The drop-curtain has this peculiarity: as the height of the building would not allow its being raised, sash-like, in the now accepted method, it was divided horizontally into two divisions; the lower part, the drop-scene, rising behind the upper part, which depicts painted drapery. The motion of these portions is regulated by the speed at which their respective drums revolve.

TOWER OF THE CHURCH AT HAUTE ALLEMAGNE, NEAR CAEN.[1]

OF the history of the parish of Allemagne, nothing is known. The portion of its church here figured, has been selected for engraving, as an instance of a Norman tower of unquestionable antiquity, and in the highest preservation.

The pyramidal roof, similar to that of the Church of St. Michel de Vaucelles, at Caen, appears quite to be in its original state. Even the small lucarne window in it looks coeval with the rest. The row of intersecting is beautiful and peculiar.

BUILDING OF THE YOUNG MEN'S CHRISTIAN ASSOCIATION, BOSTON, MASS. MESSRS. STURGIS & BRIGHAM, ARCHITECTS, BOSTON, MASS.

[Gelatine print.]

WE regret that it has not been placed within our power to publish either plans or a description of this building.

NEWSBOYS' LODGING-HOUSE, NEW YORK, N. Y. MESSRS. VAUX & RADFORD, ARCHITECTS, NEW YORK, N. Y.

THE CITY-HALL ON THE PIAZZA DEL CAMPO, SIENA, ITALY.

THIS building was built by Agostino and Agnola da Siena in 1295–1309.

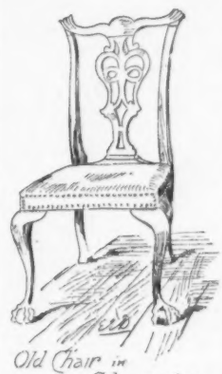
THE CATHEDRAL, FLORENCE, ITALY.

THE Church of Santa Maria del Fiore, dominated by Brunelleschi's dome, and flanked by Giotto's campanile, is too well known to require description here.

ART LOSSES AT COPENHAGEN.— We hear from Copenhagen that the principal losses among the artistic treasures of Christiansborg (called Christianborg by most of our newspapers) are the following: Thorwaldsen's splendid marble freize, the "Triumph of Alexander," still hangs on the naked walls of the Riddersal, but calcined and utterly ruined. Jerichau's colossal marble group of "Hercules and Hebe" was saved in the most spirited way by a troop of sixty artillery soldiers; but the "Adam and Eve" and the "Panther Hunter" of the same sculptor, the latter his masterpiece, stuck on the staircase, and had to be abandoned. A series of important historical frescoes by Lorenzen, including a "Battle of April 2, 1801." and a "Return of Thorwaldsen," perished. As is known, however, the great majority of the collections were saved, the pictures being carried, covered in cloths, into the huzzars' barracks. Much of every kind has been saved, but it is impossible yet to tell exactly what, as the objects were hurried into all available places of shelter. The losses seem to be principally of sculpture, but the saving of the Thorwaldsen Museum makes all minor destruction seem of little importance.— *Pall Mall Gazette.*

[1] From Cotman's "*Antiquities of Normandy.*"

THE EADS SHIP-RAILWAY.



MR. JAMES B. EADS has placed on exhibition at the Union Switch and Signal Co.'s building in Pittsburgh a $10,000 model of his marine-railway. It is no less than a perfect working-model of the proposed ship-railway over the Mexican isthmus.

It is four years since Mr. Eads proposed his present plan. Since that time Mr. Eads has been engaged in having surveys made, perfecting the details of his scheme, and in bringing the matter before the Congress of the United States, in order that his own Government might have the opportunity of aiding it in the interest of American commerce. The Committee on Commerce of the United States Senate, after having taken considerable amount of evidence and after having very carefully considered the whole question in all its bearings, made by a unanimous vote a favorable report to the Senate recommending that the bill should be passed in the interests of the country.

A concession was obtained from the Mexican Government by Mr. Eads in 1881, which extends over a period of ninety-nine years from its date. This concession authorizes the construction across the Isthmus of Tehuantepec of a ship-railway, an ordinary railway and a line of telegraph. There are other important provisions, such as exempting ships and merchandise in transit from government duty, granting the concessionaire 1,000,000 acres of public land, and guaranteeing protection during the construction and subsequent operation of the works.

The proposed railway will be about 134 miles in length. Commencing from the Atlantic side, the route will start from the Gulf of Mexico, and the Coatzacoalcos river will be utilized to Minatitlan, about 25 miles distant from the Gulf, in which the tide has a rise and fall of 18 inches only. From Minatitlan the route extends over an alluvial plain, on quitting which the line enters an undulating tableland, presently following a succession of broad valleys between which there are wide-spreading table-lands, the whole forming an extensive interior basin, bordered on its eastern and western sides by irregular mountain ranges, spurs of the main Cordilleras. The line descends thence by easy grade to the Pacific coast. The maximum gradient is only one per cent. Bocca Borra will probably be the terminus, as there is only a tide of five feet there.

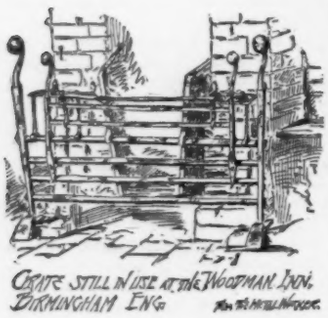
The details of the ship-railway are perfectly illustrated by the model at the Switch & Signal Works. A perfect ship, seven feet long, is raised up out of the water, put on its car, run across an imaginary isthmus and put safely down in the Pacific ocean. Practically the ship is elevated from the sea level to that of the railway by means of a large floating dock or pontoon, which may be described as a huge iron box. In practice, this pontoon would be about 450 feet long, 15 feet deep and 75 feet wide. It is arranged to float or sink in a basin, in which its vertical movement is guided. On each side of the basin there will be twenty or thirty iron rods, arranged vertically, and secured to the bottom of the basin. These rods will be capable of holding the pontoon so as to prevent it rising above the level of the railway when the ship and cradle have been taken from off it. The deck of the pontoon is laid with rails which will correspond exactly with those on the permanent land line when the pontoon is floated. When in this position a cradle on wheels and capable of carrying the ship, is run on to the pontoon, which is then submerged by admitting water into it through sluice gates, which are regulated from the top of two quadrangular water-tight towers attached to the deck of the pontoon, and between which there is sufficient width for the cradle and ship to pass. When the pontoon has been submerged to a sufficient depth for the bottom of the ship to clear the supports upon which it is intended she shall rest, the vessel is floated in from an adjacent basin, and secured over the top of the carriage or travelling cradle. The pontoon is then pumped out by means of a powerful pump, and its deck rises up to a given hight above the water, its farther progress being stopped by the heads of the vertical rods before alluded to. The rails on the deck of the pontoon now range precisely with those on the land, and while the pontoon is in this position locomotives are backed up and attached to the traveling cradle, and it is started on its journey across the isthmus. On reaching the end of the line the traveling cradle is run on to another pontoon, which is submerged, and the ship floated off into another basin on its way to its destination.

The traveling cradle has a bottom composed of hydraulic rams, all connected, and on these the ship rests. Their being connected allows the ship to rest evenly upon all of them as if in water itself. The tops of the rams are large steel plates on toggle joints which adapt themselves to the sides of the ship. The cradle is mounted on about 360 wheels, each wheel being flanged on both sides. Each of the platform girders is supported by 12 strong spiral springs resting on the bearing of 12 of these wheels, and as each girder carries but 100 tons of the dead load, each spring transfers to a wheel eight and a half tons. Each spring requires 20 tons to close it up, and has a range of five inches. When the rams are withdrawn the weight of the platform

rests on these springs, and of course, partially closes them, leaving still 2½ inches or 3 inches of play in each spring to allow the wheels to pass over any inequality of the rails which may happen to exist. The wheels are hung independently — that is, each is separate from its fellows, having its axle protruding on each side sufficiently far to furnish a proper bearing. The breakage of any one wheel, therefore, would not affect any other wheel, and if even a dozen were to break the great number that would be left would possess such an enormous surplus of strength, compared with the broken ones, that derailment may be considered as practically impossible. The chances of derailment are still further reduced by the circumstances that the railway will have no curves, and the speed will be limited to ten miles an hour. Mr. Eads considers that besides the equal distribution of the load over the wheels, the avoidance of all curves in the road is absolutely necessary to render ship railway transportation practicable. In order to avoid having curves, and at the same time the necessity of making enormous excavations to preserve the straight direction of the road, floating turn-tables are introduced wherever it is necessary to change the direction of the route. This is another remarkably simple and clever device, and it not only serves the purpose, but it constitutes a shunting place, where ship-carriages coming from opposite directions may conveniently and rapidly pass each other.

As the road is not intended to carry such vessels as the Great Eastern, but is to be constructed for profit, its probable cost will be but $75,000,000. If in the future the transport of such large vessels should be required and promise to be profitable, it would be practicable to carry them by increasing the width of the road bed, the size of the cradles, and the flotation power of the pontoons and turntables. Ships of 5,000 ton gross weight will include 90 per cent of the present tonnage of the world, and the ship-railway will be constructed to accommodate these as the maximum sized vessels. The single track is considered to be capable, with only the five turn-tables that are necessary to change the direction of the road in difficult parts of the line, to permit ten or twelve ships starting from each end of the line to pass each other daily, and to accomplish the trip in fifteen or eighteen hours without difficulty. If these vessels averged but 1,500 tons each day they would amount to at least one quarter more than the Suez Canal is accommodating to-day. The above estimated cost is based upon the most careful computations by Mr. Eads upon the entire project, including harbors, docks, roadway and general plant and machinery for transporting vessels of 5,000 tons gross weight. — *Pittsburgh Commercial Gazette.*

LIMOGES.



WHEN we first saw Limoges, in 1857, says Mr. E. A. Freeman, in an article in the *Guardian*, its great church was still a fragment. It had something of the air of Köln. About one-half of a great French church rose high in the air, and at some distance to its west rose a tall and slender tower of a most singular air. But the tower did not, as at Köln, suggest imperfection as well as the unfinished body. There was no crane to show that there still was work to be done, and though, as we come to learn more of the history of the building, we find out that the tower has been shorn of a spire, yet no one at first sight would say that a spire was at all needed. That is to say, in 1857 the church of Limoges was altogether unfinished. All that was left of the Romanesque church was the lower stage of the tower. Far to the east of it a magnificent church of the later French type had been begun; the choir and transepts were finished; the whole nave had been traced out and begun, but only about two bays were ever finished. In the sixteenth century the thought of carrying on the work seems to have been given up, as then the church was in a manner finished inside by adding a great organ-loft, handsome after its own fashion. The Romanesque church, in short, had given way to a Gothic church which remained a fragment, and so a gap was left between the actual church and the tower. In 1857 there was talk of filling up the gap, and now in 1883 it is all filled up; in short, the nave is now nearly finished. The work reminds one of Bristol, only to finish the lofty nave of Limoges was a greater work than to build the far lower nave of Bristol. Also at Bristol there was no ancient tower standing near where the west end had been or was to be, whose existence could not fail in some measure to influence the finish of the new work. At Bristol the architect could design his west front how he pleased, and we may be allowed to doubt of the wisdom of adding western towers to so small a church, especially as their addition implied the destruction of a still surviving piece of the monastic buildings. At Limoges there was the more frightful danger lest the ancient tower should be doomed to give way to the modern architect's notions of a west front. There was some such fear in 1857; but happily it seems to have passed away in 1883. It must be allowed that the tower stands awkwardly in the way of the new work, as it is not in the same line, and will have to join on in some way at a corner; but the new building seems to be adapted to it so far as it may be. The contrast will be great, and the tower will lose a good deal of its seeming height by having so lofty a building attached to it. But the two must agree as they can. No one could wish the tower to be touched, and no one can quarrel with the completion of the body of the church.

The tower is a strange building enough. On a vast square base, which, if itself carried up as a tower, would bring down Wymondham and even Ely to utter insignificance, stands a much narower square stage, from which rises a slender octagon of three stages, set on in an unusual fashion — lozenge-fashion, if that word may be applied to an octagon, reminding one somewhat of the way in which the upper stage of the tower of Cartmel is set on the lower. This is the custom of Limoges; the towers of the other two surviving churches of the city have just the same character. Like some of the work at Angers, they keep the lines of the earliest Gothic; but their real date is late in the fourteenth century. The other two churches, those of St. Michael and St. Peter, keep their spires; the spire of St. Stephen's is gone.

These Limousin towers have a certain interest as examples of a very local form. We may doubt whether we really admire such singular height and slenderness and piling of stage on stage, very different from the artistic composition of such a tower as Bishop's Lydeard. But they are at any rate striking from their boldness and novelty. But the tower of the cathedral church has a far higher interest. To know what it really is we must go inside. The square base is masked by a casing, perhaps of the last days of the eleventh century; but within is the lower stage of the tower of the original Romanesque church, which, we can hardly doubt, stood as a detached campanile. The lowest story, after a fashion rare but not unique, stood open. Four large columns, with their round arches, supported a kind of cupola; but the design was ruthlessly disfigured when the tower was cased. The columns were walled up and pointed arches were inserted. But it is not hard to call up the original effect, which may be seen in a less changed state at Le Puy, where, however, square piers take the place of columns. The odd thing is that the lowest stage of these towers presents the exact design of a Byzantine church of the smallest scale, lacking only the eastern apse. Yet there can be no reasonable doubt that both these buildings were meant to be what they are, the lower stages of towers; only that at Le Puy has been carried up with great skill in a later form of the same style, while at Limoges the far later tower sits with some measure of awkwardness on its ancient base.

When we first saw Limoges, in 1857, there were still to be seen on the west face of this tower the traces of a church contemporary with the blocking of the columns and the introduction of the pointed arches. They have now given way to the necessities of the work of finishing the imperfect nave. They point to a church of considerable height, with aisles, very plain and simple, but using the pointed form in its constructive arches. Now, what is the date, first of the blocked columns, secondly of the work that blocks them? There was at Limoges an ancient basilica, attributed to Saint-Martial, the apostle of Limoges, in impossibly early times. Rome and Ravenna cannot show churches of the third century or earlier. But we need not doubt that a fellow to the churches of Rome and Ravenna lived on at Limoges till about 1012, when Bishop Hilduin began or at least ordered the building of a new and larger church. This is witnessed by the Aquitanian chronicler, Ademar of Chabennes. In 1095, Pope Urban consecrated this church or some other on the site. The present church was begun with funds left by Bishop Americ de la Serre, who died in 1272. Here are our dates. The tower in its oldest shape, if it stood along with the old basilica, must have been an addition to it. It would do very well for work of 1012; but Hilduin's church was barely begun, if begun, and its tower, if it had one, would be much later than that date. We are tempted to suspect that the four columns are older than 1012; that the blocking of those arches and the church of which we see traces against the recased tower belong to a rebuilding, begun perhaps in 1012, but carried on slowly, and perhaps not fully finished in its western part even at the dedication in 1095. In this way the appearance of the pointed arch — here, as in Italy, a sign of the Saracen — really becomes no great puzzle. Under the present choir is a crypt, which ought to throw some light on the Romanesque building. But as it can be seen only by lifting up a stone which takes six men to stir it, it is pretty well forbidden ground to the ordinary traveller.

We now pass from this tower, precious relic of an earlier time, to the later church, the church which is now hasting to meet the ancient tower. Here we find ourselves carried into another world of art and history. Limoges cathedral, or so much of it as is built, is one of the loveliest examples of the best French Gothic style. We say French advisedly; by the year 1273, the elder local forms of art had pretty well passed away. One general model prevailed through the whole of what had now become the kingdom of France. And within that kingdom few buildings can, for internal effect at least, outdo such a church as the still fragmentary St. Stephen's, of Limoges. It does not come in point of scale in the first class of French churches; it does not rank with Bourges, Chartres, or Saint-Ouen's; the dimensions on the ground plan even of the completed church would in England place it very low indeed, and even in France it does not cover anything like the same ground as the great buildings which we have just named, and, much smaller in extent, it is also, by all laws of proportion, by no means their rival in positive height. But its

relative height is fully equal to theirs; it has all the loftiness which distinguishes a French church from an English one, and we fancy that it must be positively higher than any English church except Westminster and York. And though the arch of the vault is perhaps a little too low, there is no church of any scale or country in which the internal design is, on the whole, more skilfully managed. The leading design of the elevation is that of the lofty pier-arch and tall clerestory, with only a small triforium between them. It is a problem in such a case to design the triforium so as to make it a subordinate, or at least an intermediate feature, and yet not to make it insignificant. It should not be either so prominent or so unimportant that anybody could wish it away. We admire, perhaps without altogether approving, the glazed triforium at Saint Ouen's, and, on a smaller scale, in the choir of St. Peter's at Chartres. But this is not the purpose of a triforium; it suggests the retort that, if you want more glazed space you should make a longer clerestory, and the clerestory in both those churches is quite long enough. The Limoges triforium is, as it should be, an essentially internal feature, a modest feature, a feature not asserting any special prominence, but whose absence would at once form a blank. The transepts, too — a difficult part of the building to deal with in these churches without central towers — are dealt with here with thorough skill. The architect of Limoges cathedral tried the same experiment which was tried by the architects of St. Mary Redcliff and of Bath Abbey. He made his transepts considerably narrower than the nave and choir. At Limoges, where there was to be no central tower, it was open to the designers to make the transepts narrower if they chose. At Bath it had the absurd effect of making the central tower oblong, as it doubtless would at Redcliff, if the tower had ever been finished. But even in the other cases the experiment was a daring one, and we cannot help thinking that the experiment at Limoges succeeded better than the experiment at Bristol. The transepts, somewhat like the triforium, are after all a secondary feature, especially when there is no central tower. They must be not insignificant, and yet they must not be so prominent as to overshadow the eastern and western limbs.

At Limoges, where there can never be any real west front, we might have approved of a great façade to the transept better than in some other places; but the narrowness hindered anything like the great fronts of Chartres. The designer adapted himself to his conditions: instead of a rose-window, to which there was not breadth enough to do justice, he made a very noble pointed window with a prominent spherical square. Within, the narrowness at once marks the transept as subordinate, and at the same time gives it a character of its own. The effect of height is of course greater than in the wider parts of the church. The experiment in short has succeeded. We do not, as in some French churches, wish the transepts away on the ground of insignificance, nor yet do we feel, as in some others, that they have taken to themselves an importance which belongs only to the east and west ends of the building. And the discretion of the Limousin builders seems to have lived on through many generations. The church went on building, with some interruption, from 1273 to 1554, and the difference between the work of different dates is plain enough. Yet all is thoroughly harmonious. We see that there is work of different dates, not by any change in the general effect, but wholly by the details, mainly by the change in the tracery of the windows, which in the western part of course becomes Flamboyant — good Flamboyant, be it observed. There is no building in which one can better sit and gaze and muse — looking, of course, eastward or else across — than in St. Stephen's, at Limoges. The effect of some of the vaster churches is more overwhelming; there is none which is more thoroughly satisfactory, none which is at once more pleasing to the eye and more thoroughly commends itself to a critical judgment. If there is a fault, it is that the vaulting arch is a little too flat; but its flatness is not so great as to have the same killing effect as in the metropolitan church of Rouen.

COPPER ROOFS.

PHILADELPHIA, PA.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — An article has lately appeared in the *Mining Gazette* in reference to the advisability of architects, builders, etc., using copper roofs, and urging their use on account of durability, and the present low price of manufactured copper, basing the statements on the price of ingot copper, and the cost of manufacturing it into sheet copper at three cents a pound, without regard to the thickness of the sheets manufactured. This article has been copied by many of the leading journals devoted to architecture and building throughout the country, and has no doubt attracted much attention from those interested in the subject. We have read it carefully, and it is so misleading in its statements, so inaccurate in its deductions, and such absurd prices as to the cost of manufactured copper are given, that we take the liberty of correcting some of these statements to show why in our opinion copper roofs generally in this country cannot take the place of other material, not altogether because of the great expense, but because, unless put on so as to avoid the great expansion and contraction, the roof will be utterly useless for the purpose for which it is intended. Although this firm is not engaged in the roofing business, it has within the past ten years, we believe, supplied a very large portion of the sheet-copper that has been furnished for the different Government and State buildings, besides large quantities of sheet-copper for gutters, valleys, etc., to the trade in general; hence we do not write this letter without some knowledge of the facts of the case.

We do not doubt all that is said in regard to *durability of copper roofing*, nor is there any question in our minds as to the vast number of inferior roofs, which have been and are being put on at the present day. We do not hesitate to assert that the fault lies not only with owners of property, who are not willing to pay a good price for a good roof, but with architects, who when specifying tin plates, simply specify "IC or IX Best Charcoal Roofing," which in reality means nothing. The great expansion and contraction of sheet-copper is such, that if a copper roof is put on in the ordinary way a tin roof is, say of 16-ounce copper, it cannot be secured by solder, nails, or screws that will hold any length of time, and make a secure roof. The Government formerly used 16-ounce copper on all public buildings, and though these roofs were put on at the time by competent firms, we have it from a reliable authority that the expenses of repairs on Government roofs up to the present time will show a loss to the Government of so much money that the public at large would not believe it; in fact, it has been asserted that in some cases, the weight of the solder used in patching these copper roofs to keep them from leaking would amount in weight to almost the original weight of the sheet-copper put on. The Government has after a series of experiments come to the conclusion to use no copper heavier than 10-ounce for the body of the roof. Amongst all the patents, of which there are many for putting on copper roofs, we believe there is only one, so far, that can practically make a first-class copper roof, by which the edges of the sheets are positively fixed at frequent intervals, and the sheets of 10-ounce copper being light, will buckle between the fixed points, and not be dragged backwards or forwards over the whole roof. By this patent, the expansion is thus distributed over the whole roof, and between any contiguous fixed points is so slight, that it is scarcely appreciable. The size of the sheet used should not be more than 24 inches wide, and 48 inches long, about 3 inches off the width is required for grooving.

We understand that by this patent, it would cost about 10 cents per square foot to lay this roof, over and above the price of the material; or take 10-ounce copper at the market price to-day, and we hardly think it possible to lay a roof at less expense than 31 cents per square foot, or over double the amount stated by the *Mining Gazette*. This would be nearly four times the cost of using the heaviest coated tin roofing-plate in the market. While it is true that even an extra-coated plate must be painted from time to time; yet even taking into consideration the cost of painting every few years, the interest alone on the original amount expended for a copper roof over tin, would in the course of many years be a very important item. Our figures for putting on a copper roof are based on plain copper, while the Government uses copper tinned on both sides, which adds a cost of five cents per square foot; but we do not believe that there is any necessity of tinning a roof, unless used in such States as Texas and other places where they are more or less dependent for water caught from the roof. Though sheet-copper is largely used for gutters, valleys, etc., we think that you will find upon investigation that great difficulty is experienced by the most competent houses in making durable jobs of sheet-copper, in fact it is almost impossible to make long lengths of some gutters without breakages soon occurring. We have in our city quite a number of buildings that have been roofed many years with sheet-copper, but we are informed that there are constant repairs needed on these roofs. There is no question in our mind, as to the durability of copper, and that a copper roof properly put on is the most lasting one. Under the patent referred to, we have no doubt that a perfect roof can be had; yet as to the question of cheapness as regards other roofs, it has only been our intention in this letter to point out why the statements made by the *Mining Gazette* are misleading to architects and builders.

We have given the subject of copper roofing our personal attention for many years, and if any of the statements made by us are incorrect, we trust that those who have had a practical experience in this line, will give you their views on this subject.

Yours truly, MERCHANT & CO.

APARTMENT-HOUSE PLANNING.

BOSTON, MASS., November 22, 1884.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In a paper read by Mr. T. M. Clark, before the Society of Arts, he speaks of apartment-houses being built within *a year or two*, in which the parlor, dining-room, etc., were on one floor, and the chambers and bedrooms on the floor above, and the two floors connected by a private staircase. I built an apartment-house of this kind for Eben Wright, in the Town of Brookline, in the summer of 1875.

The arrangement has always given satisfaction so far as I know.

Yours truly, O. F. SMITH.

NOTES AND CLIPPINGS.

TUNNELLING UNDER THE STRAITS OF MESSINA. — Signor Gabelli, civil engineer, has published in a recent official report his ideas on uniting the Island of Sicily with the Italian Peninsula by means of a tunnel. The first thing to be considered, according to Signor Gabelli, is the conformation of the sea bottom at the Straits, and he states that

it is beyond all doubt that in a southeasterly and northwesterly course, starting from Pizzo, on the coast of Calabria, and ending at Sant. Agata on that of Sicily, exists a submarine chain of mountains separating the basin of the Mediterranean from that of the Adriatic. The sides of these mountains are very steep; in fact, while the crest of this ridge is only 110 metres under the surface of the sea, at two km. away from it the depth attains 260 metres, in front of Messina it is 340 metres, and in the offing of Reggio 657 metres. The course of the contemplated tunnel is, therefore, clearly established from these hydrographical conditions. It only remains to be seen whether the nature of the soil is sufficiently solid and compact for the purposes required. It was necessary to ascertain the exact formation of the rock to be pierced, and on this point geologists differ. The tunnel, according to Signor Gabelli, would be 13,546 metres from end to end, cost seventy million francs, and would take, if everything went smoothly, five years to complete.— *The Iron Age.*

Church Bells for Civil Uses.— There was a warm controversy some months ago in France over church bells and the expediency of the legislative decision that the right to use them should no longer be exclusively vested in the parish priests, but should be shared by the mayor of the town or commune. In general, since the Chambers authorized the prefects, or mayors, of France to ring the bells whenever it pleased them, the privilege has not been abused, but the prefect of the Haute Marne appears inclined to exercise his privilege in and out of season. He has issued a circular to the mayors of his department advising the civil authorities to set the bells of churches ringing to call children to school, to announce the dinner-hour and the hour for resuming work to field laborers, to notify the time for closing cafés and cabarets, to indicate the opening of the municipal sittings, to call grape-pickers to work during the vintage, to announce the arrival of the tax-collector, and on sundry other occasions which need not be enumerated. Supposing the prefectoral circular to be obeyed to the letter, church bells will be ringing almost incessantly in the Haute Marne, and will be so much monopolized for civil uses that they will hardly be available when required for religious purposes.— *London Standard.*

The Assos Sculptures.— A distinguished European archæologist, in a private letter, writes to the New York *Evening Post* as follows: "I really cannot believe that the Boston men will be silly enough to drop the matter about the Assos epistyle. I thought, and still think, that Americans have got a little backbone of their own, and do not allow a set of ruffians like the Turks to take away from them what they legally possess. I, for my sake, don't care about it, as New York is still farther off from me than Constantinople; but if the matter is dropped, the Turks will see that they can do anything against Europeans and civilized men in general without the least fear of getting a lesson. If the Boston men began a regular action against Hamdi Bey and the Turkish Ministry of Public Instruction, no tribunal in the world could give them wrong, because: 1st. The excavations at Assos were begun under the régime of the law of 1874, which enacts that indivisible sculptures shall not be divided, but valued and given up to the finder in exchange for their estimated value; 2d. In allowing Bonndorf, in 1882, to carry away the frieze of the Göl-Bagtché Mausoleum, the Turks formally acknowledged that a frieze formed an indivisible whole; 3d. In allowing the Germans, in 1884, to take away their discoveries from Pergamon after the promulgation of the new law (February, 1884) forbidding the exportation of antiquities, the Turks acknowledged that excavations begun under the régime of the former law of 1874 remain subjected to the clauses of that now abolished law. The Assos case, therefore, is quite an *abus de pouvoir* on the side of the Turks, and an *abus de laisser aller* on the side of the Bostonians. The money for excavating at Assos was raised by private means; the subscribers have a right to see that they get something for their money. If your Minister in Constantinople made a row at the Porte, and said what we all think about Hamdi's impudence and encroachments, the missing fragments of the epistyle and all the architectural specimens would be returned to their rightful owners."

The Electric Light in the Mechernich Mines.— The electric light installation at the Mechernich Mines in its once volcanic Eifel district in Rhenish Prussia has now had a fair trial for more than three years, and has proved a complete success. The expectation that it would both facilitate the operations and increase their security has been fully realized, and an extension of the plant is now being carried out. Messrs. Siemens & Haleke, of Berlin, undertook the work, which was superintended on their behalf by Mr. Boeddinghaus. An open working 2000 feet long, 1000 feet wide and over 300 feet deep, in which 300 men and 20 horses are continually occupied, was first to be supplied with the electric light. This part of the mine is excavated in steps, the horizontal terraces being provided with rails. Ordinary lamps in globes on poles were out of the question, as blasting operations continue throughout the day, and the shots would soon have made havoc of the lamps. After several trials, two powerful lamps of three thousand candles each were erected at the upper margin of the pit, where they were fairly out of the reach of the projected stones, and reflectors were fixed to throw the light down upon the steps. To find the proper positions for these powerful lamps and to avoid too dark shadows caused some difficulty. But the illumination was finally rendered most efficient, and the open pit with the light playing on the whitish gray rock affords a fine spectacle. As any interruptions, even for short periods, such as those occupied in renewing the lamp carbons, would be dangerous, the whole plant is double, each lamp receiving its current from a D_2 dynamo. No hitch of any kind has occurred; and the safety of the miners has decidedly been augmented. It was formerly not always possible for the superintendents to see whether the loose mass resulting from the blasting operations had been properly removed, and frequent minor accidents arose from the débris falling down upon the miners engaged on the step next below. The work can now be controlled much better than before, when petroleum lamps and hand lamps were in use. The cost shows a saving of about 4d. per hour in favor of the electric illumination. The satisfactory results obtained in the open working induced the company to introduce the electric light down in the subterranean galleries. The ore forms little concretions of sand and galena scattered all through the rock; the whole mass had, therefore, to be brought to day to be disintegrated and sifted, and the mining proceeds in parallel and cross galleries, which are constantly being widened until they become 90 feet in width and 70 feet in height, by sometimes 300 feet in length. The operations in themselves would not require much light, if there was not always danger threatening from loosened pieces of rock. Pitch torches were formerly employed to examine the bore-holes and fissures round them after each explosion. It was a question whether the arc-lamp would answer for this purpose in the smoky atmosphere. For the first experiments, arc-lamps of three thousand and one thousand candles were used, with the positive carbon in the lower holder. The effect was brilliant, yet the light did not penetrate the white smoke cloud which collects at the upper wall immediately after the shot. But, as the smoke settles within ten minutes, it was thought advisable to acquiesce in this interruption of a few minutes, and to use smaller lamps of three hundred and fifty candles, which proved quite efficient. Of these there are ten in use with about ten thousand feet of lead cable, the cable being partially elastic, as the lamps with their wires have to be removed when the blasting is to take place. The lamps were originally supplied with hexagonal lanterns with obscured glass to protect the eyes of the miners. The glasses were, of course, soon broken, but no complaints are said to have been made about the naked electric lights. The proprietors of the mine have decided upon an extension of the installation.— *Engineering.*

A Comparison of Imperfect Heat Conductors.— Mr. J. J. Coleman has read a paper before the Glasgow Philosophical Society on the heat-conducting power of materials, with special reference to the porous, loose substances commonly used as non-conducting coverings. The experiments conducted by Mr. Coleman were simple, and involved low-temperature tests only, consisting, as they did, of observations of the melting of ice. A number of ten-inch cubical boxes, of thin tin plate, were filled with ice, and placed inside eighteen-inch cubes, also of thin tin plate, the intervening space being filled with the substance to be tested. The boxes thus arranged were kept in a room maintained at an equable temperature of about 60° F., and the quantity of water obtained per hour from the melting ice was drawn off and measured, thus affording data for the calculation of the quantity of heat penetrating to the ice. The materials used were slag-wool, hair felt, charcoal, wood shavings, breeze, wood and air space, sawdust, cotton wool, sheep's wool and infusorial earth, thus fairly exhausting the non-conducting substances in common use. From the mean of the experiments, it appeared that the heat-conducting power of the various substances stands in the following order: Slag-wool, 100; hair felt, 117; cotton wool, 122; sheep's wool, 133; infusorial earth, 136; charcoal, 140; sawdust, 163; breeze, 230; wood and air space, 280. All these observations were made after the vessels had been in the constant temperature of the room for eighteen hours, to allow equilibrium to be established. All the materials were dried by being kept in a well-ventilated room, warmed by a fire, for several weeks before the commencement of the experiments. It is remarked that considerations of cost and strength to withstand shaking must largely qualify the experimental results when it is a question of using the materials on a large scale. Thus, although one thickness of slag-wool is as good as 1.4 thicknesses of charcoal, or 2.3 of coke breeze, the cost of either of the latter would be much less in practice.— *Manufacturer's Gazette.*

Bricks from Glass-works Sand.— M. Hignette, in the *Bulletin Technologique des Ecoles Nationales d'Arts et Métiers*, describes a new ceramic product from the waste sands of glass factories, which often accumulate in immense quantities so as to occasion great embarrassment. The sand is subjected to an immense hydraulic pressure, and then baked in furnaces at a high temperature, so as to produce blocks of various forms and dimensions, of a uniform white color, which are composed of almost pure silex. The crushing load is from three hundred and seventy to four hundred and fifty kilogrammes per square centimetre. The bricks, when plunged in chlorhydric and sulphuric acids, show no trace of alteration. The product has remarkable solidity and tenacity; it is not affected by the heaviest frosts or by the action of sun or rain; it resists very high temperatures, provided no flux is present; it is very light, its specific gravity being only 1.5; it is of a fine white color, which will make it sought for many architectural effects in combination with bricks or stones of other colors.— *Chronique Industrielle.*

The San Francisco Garfield Statue.— The bronze statue of Garfield, executed by Prof. Lenz, of Nuremburg, on an order from San Francisco, is completed, and has been placed on exhibition at Hamburg. It is of heroic size, the figure being ten feet high. It represents the late President standing erect, with his head uncovered, and clothed in ordinary civilian dress. On the sides of the pedestal are figures representing war trophies and the American eagle. The front face of the pedestal bears in large raised letters the name, "Garfield." The model of the statue was made by Herr Happersberger, a sculptor born in America, but now residing in Munich.— *Boston Star.*

A Time Limit to a Balloon's Flight.— A famous æronant says that no balloon has ever gone over a second sunset. The moment the sun goes down the gas condenses, and you get through the night better than the day. But the next day, in the presence of the sun, the gas expands, and you mount to great elevations; but every mount the balloon makes cripples its power, and it is only a question of hours, if not minutes, how long you can keep up. If an æronant could have forty-eight hours of night, he could travel a great distance. The highest rate of speed he had ever attained, even with a strong wind blowing, was eighty miles an hour.— *Exchange.*

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BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

308,048. Burglar-Alarm. — Benjamin S. Barckdall, Indianapolis, Ind.

308,055. Sash-Fastener. — Isaac N. Buck, Elgin, Ill.

308,057. Shutter-Worker. — Henri Camus, St. Louis, Mo.

308,066. Composition-Paint for Ships' Bottoms, Dry-Docks, etc. — Jas. H. Dilks, Jersey City, N. J.

308,073. Furnace. — Alfred Hopkins, Bridgeport, Conn.

308,111. Art or Process of and Composition for making Artificial Stone. — Jas. H. Trickey, Hamilton, Ontario, Can.

308,125. Door-Hanger.—William Barry, Syracuse, N. Y.

308,128. Shutter-Fastener. — Isaac Brooke, Pottstown, Pa.

308,134. Mitering-Machine. — Paul Cashin, San Francisco, Cal.

308,143. Fresco-Painters' Sizing. — Hubert De Rossi, New York, N. Y.

308,145. Try-Square. — William B. Edwards, Unionville, Conn.

308,164. Decorative Painting on Glass.—Emile J. Irlande, New York, N. Y.

308,177. Stay-Roller for Sliding-Doors.—Emil Laass, Syracuse, N. Y.

308,179. Fire-Escape. — Henry T. Linnenbrink, Rochester, Pa.

308,184. Wood-Flooring. — Dudley J. Marston, Salisbury, Mass.

308,186. Self-Closing Faucet. — Timothy McHugh, Boston, Mass.

308,194. Shutter-Worker. — Miles E. Peterson, Chilton, Wis.

308,197. Circulating-Pipe for the Transmission of Heat. — Berhard Rober, Dresden, Saxony, Germany.

308,213. Miter-Machine. — Jared Stilly and John H. Lowery, Lebanon, Pa.

308,228. Casing for Pipes.—James F. and John F. Wood, Wilmington, Del.

308,246. Screw. — John Frearson, Birmingham, County of Warwick, Eng.

308,247. Screw-Driver. — John Frearson, Birmingham, County of Warwick, Eng.

308,251-253. Manufacture of Spikes and Machine therefor.—Howard Greer, Chicago, Ill.

308,279. Fire-Escape. — Henry Reusch, Quincy, Ill.

308,287. Tape-Measure.—Frank M. Slagle, Alton, Iowa.

308,288. Hot-Air Generator.—George S. Sperry, New Richmond, Wis.

308,303. Brick-Machine. — Charles L. Carman, Chicago, Ill.

308,307. Stopper in Wash-Bowls, Sinks and Bath-Tubs.—Mathew F. Deegan, Chicago, Ill.

308,317. Chimney-Cowl.—Martin Ludwig, James S. and John S. Barber, Beloit, Kans.

308,323. Cable Fire-Escape.— John J. Oros, Chicago, Ill.

308,332. Rabbet-Plane. — Justus A. Traut, New Britain, Conn.

308,334. Ladder. — Edward P. Wright, Portland, Oreg.

SUMMARY OF THE WEEK.

Baltimore.

Club-House. — Frank E. Davis, architect, has prepared plans for the Maryland Bicycle Club, for a three-st'y brick building, with bluestone facings, 24′ x 80′, cor. Mount Royal Ave. and Reservoir St., and to cost $12,000; H. C. Smyser, builders.

Monastery. — The corner-stone of the Passionist Monastery of St. Joseph, two miles west of this city, was laid November 16.

Warehouse. — Henry Brauns, architect, has prepared plans for Virginius Gaddess, Esq., for a four-st'y brick, stone, and terra-cotta building, 26′ x 65′; to be erected on South Charles St., near Camden St., and to cost $6,000; J. W. James, builder.

Building Permits. — Since our last report fourteen permits have been granted, the more important of which are the following: —

Fred. Stums, 5 three-st'y brick buildings, w s Druid Hill Ave., com. n w cor. Laurens St.; and 8 two-st'y brick buildings, n s Laurens St., bet. Druid Hill Ave. and Etting St.

John F. Nelker, 3 three-st'y brick buildings, n w cor. New and Jasper Sts.

Jacob Suger, three-st'y brick building, e s Pennsylvania Ave., bet. Orchard and Biddle Sts.

Wm. I. Davis, three-st'y brick building, n s Montgomery St., bet. Williams and Johnson Sts.

U. S. Electric Light Co., one-st'y brick building, 27′ x 36′, n e cor. Holliday and Centre Sts.

John Hubner, 5 three-st'y brick buildings, w s Fremont St., s of Lafayette Ave.

Bauernschmidt & Marr, 2 two-st'y brick buildings, n s Cross St., w of Ridgely St.

Boston.

Building Permits. — *Bennington St.*, Ward 14, for R. Hodson, Jr., wood stable, 15′ x 15′, pitch; A. J. McLaven, builder.

Houghton St., near Raymond St., Ward 23, for E. W. Taylor, wood dwell., 28′ x 30′, pitch; H. P. Oakman, builder.

Gilbert St., near Raymond St., Ward 23, for T. Klueba, wood storage, 15′ x 18′, pitch; J. Linppold, builder.

Leeds St., near Savin Hill Ave., Ward 24, for S. M. McNeil, wood dwell., 24′ 6″ x 60′, pitch; McNeil Bros., builder.

West Cottage St., cor. Brook Ave., Ward 20, for W. W. Dromey, wood dwell., 24′ x 60′, flat; W. W. Dromey, builder.

Centre St., opp. Pond St., Ward 23, for W. A. French, wood dwell., 29′ x 34′, hip.

Copley St., No. 1, Ward 23, for Mrs. O. H. Ernst, wood dwell., 26′ 4″ x 27′ 2″, pitch; S. D. Gavey, builder.

School St., No. 145, Ward 23, for Mrs. O. H. Ernst, wood dwell., 26′ 4″ x 27′ 2″, pitch; S. D. Gavey, builder.

Chester St., near Gardner St., Ward 25, for Chas. Haley, wood dwell., 12′ 6″ x 17′ and 17′ x 55′, pitch.

Pynchon St., Nos. 217, 219, 221, *and* 223, for Mrs. Hannah Dudley, 4 wood dwells., 20′ x 40′, hip; McDonald & Tobin, builders.

Ballard St., near Custer St., Ward 23, for Jno. Gardner, brick dwell., 22′ x 30′, pitch.

Porter St., No. 41, Ward 16, for W. Holmes, brick apartment-house, 18′ x 55′ 6″, flat; Holmes Bros., builders.

Main St., near Eaton St., Ward 4, for City of Boston, brick ladder and hose house, 20′ x 83′, flat; R. R. Mayers & Co., builders.

Brooklyn.

Building Permits. — *Stagg St.*, n s, 200′ e Graham Ave., 4 four-st'y brick tenements, tin roofs; cost for all, $40,000; owners, H. and H. Reiners, Stagg St., near Graham Ave.; architect, E. F. Gaylor; mason, Matthew Smith; carpenter, not selected.

Decatur St., s s, 310′ w Lewis Ave., 3 two-st'y brick dwells., gravel roofs; cost, $4,500; owner, Nellie McLain, 962 Macon St.; architect and carpenter, T. S. McLain; mason, S. Ramsdel.

Seventeenth St., Nos. 211 *and* 217, 2 two-st'y and basement brown-stone dwells., tin roofs; cost, each, $4,000; owner, Thomas Pitbladdo, 213 Seventeenth St.; architect, B. S. Brown; builders, Wm. and Thos. Corrigan.

North Second St., s s, 75′ w Graham Ave., three-st'y frame tenement, tin roof; cost, $5,000; owner, John P. Conselyea, cor. Graham Ave. and North Second St.; architect, E. F. Gaylor; builders, Jacob Schoch and Howard Boyce.

Sandford St., No. 102, w s, 110′ s Park Ave., three-st'y frame tenement, tin roof; cost, $3,000; owner, Mrs. Cunningham, 104 Sandford St.; architect, A. Herbert; builder, John Wilson.

Hancock St., Nos. 206 *and* 208, s s, 210′ w Marcy Ave., 2 three-st'y brick dwells., tin roofs; cost, each, $10,000; owner and builder, Geo. H. Stone, 301 Jefferson St.; architect, G. A. Schellengar.

Central Ave., e s, 40′ n George St., 3 three-st'y frame tenements, tin roofs; cost, $13,800; owner, Hubert Fischer, 260 Hewes St.; architect, Fr. Holmberg; builder, not selected.

Dean St., s s, 328′ w Franklin Ave., two-st'y frame stable, tin roof; cost, $4,500; owner, Budweiser Brewing Co., 946 Dean St.; architect, J. Platte; builder, J. Rauth.

St. Mark's Ave., s s, 220′ e Kingston Ave., three-st'y brick dwell., tin and slate roof; cost, about $40,000; owner, Wm. Eggert, 1015 Lexington Ave., New York; architect, G. Damen; builder, P. McGuinn; carpenter, not selected.

South Fourth St., n e cor. Seventh St., 2 four-st'y brick stores and tenements, tin roofs; cost, each, $9,000; owner, Frederick Haack, 154 North First St.; architect, E. F. Gaylor; builders, Thos. Gibbons and Samuel Hough.

Chauncey St., s s, 175′ e Patchen Ave., two-st'y brick dwell., tin roof, wooden cornice; cost, $6,000; owner, Jacob Fritz, 106 Hudson St., New York; builders, Ernest Sutterline and Jacob Pirrung.

Sixth St., n s, 147′ 10″ w Sixth Ave., 6 two-st'y brick dwells., tin roofs; cost, each, $4,000; owner, architect and carpenter, Thos. Butler, 371 Sixth St.; mason, Thomas Nash.

Marcy Ave., e s, 25′ n Heyward St., 5 two-st'y brown-stone dwells., tin roofs; cost, each, $5,000; owner, John H. Shult; builders, W. & T. Lamb and Jenkins & Gillies.

Marcy Ave., n e cor. Heyward St., three-st'y brown-stone store and dwell., tin roof; cost, $8,000; owner, etc., same as last.

Washington Ave., e s, 145′ n Douglass St., two-st'y brown-stone dwell., tin roof; cost, $5,000; owner, Mary E. Fowler, 8 Verona Pl.; builder, Levi Fowler.

Rockaway Ave., s e cor. Hull St., three-st'y brick store and dwell., and 4 two-st'y brick dwells., felt and gravel roofs; cost, each, $3,000; owners, Cozzens & Barton, 177 Stuyvesant Ave.; builder, L. E. Brown.

South First St., n e cor. Eighth Ave., four-st'y brick tenement, tin roof; cost, $11,000; owner, Mrs. John Baldwin, cor. Grand and Eighth Sts.; architect, E. F. Gaylor; mason, Jacob Bisson.

Chauncey St., n s, 525′ e Stuyvesant Ave., 3 two-st'y brick dwells., tin roofs; cost, each, $3,000; owner, Daniel Lauer, 1534 Fulton St.; architect, Amzi Hill; builders, Weeks & Lauer.

Hamilton Ave., s w cor. Columbia St., on w s Hamilton Ave. and e s Columbia St., one-st'y building for stores, felt and gravel roof; cost, $3,000; owner, Joseph J. Day, 19 Manhasset Pl.; architect and mason, J. F. Nelson; carpenter, Joseph Taylor.

Alterations.—*Chauncey St., Nos.* 9 *and* 11, one and two-st'y brick extension, etc., tin roof; cost, $8,000; owner, H. Neiland, 1098 Pacific St.; builders, J. J. Bentzen and H. J. Smith.

Chicago.

Building Permits. — N. Behrens, two-st'y flats, 128 North Twenty-first St.; cost, $3,000.

Mrs. B. Philbin, three-st'y dwell., 91 Sedgwick St., cost, $5,000.

The Board of Education, three-st'y school-house, cor. Lincoln and Division Sts.; cost, $51,000; architect, J. J. Flanders; builder, Geo. Peterson.

Jas. Novak, three-st'y store and flats, 808 Ashland Ave.; cost, $7,300.

H. H. Kohlsaat, two-st'y dwell., 2976 Prairie Ave.; cost, $20,000; architect, S. M. Randolph.

J. Downey, 6 two-st'y dwells., cor. Honore and Adams Sts.; cost, $30,000; architect, M. L. Beers.

M. Cummins, two-st'y dwell., 2520 Sanger St.; cost, $3,000; architect, J. F. Doerr.

Annie L. Gartside, two-st'y dwell., 46 Groveland Pk.; cost, $10,000.

C. W. Partridge, 3 two-st'y dwells., 3435-3439 Michigan Ave.; cost, $18,000.

L. Butler, three-st'y school-house, 507-509 North Franklin St.; cost, $10,000; architect, G. Vigeant; builder, Geo. Lehman.

G. H. Marshall, two-st'y dwell., 58 Ladin St.; cost; $6,000; architect, W. G. Williamson; builder, C. A. Moses.

H. Einmel, two-st'y dwell., 560 West North Ave.; cost, $5,000; architect, H. Sierks.

L. C. Platt, 2 two-st'y dwells., 670-672 West Adams St.; cost, $8,000; architect, J. J. Flanders.

E. Sands & W. H. Hoyt, 2 two-st'y dwells., 767-769 West Jackson St.; cost, $8,000.

Geo. Edwards, 5 two-st'y dwells., 367-373 Maxwell St.; cost, $15,000.

Chas. Thiele, two-st'y dwell., 371 Wells St.; cost, $2,500, builder, Chas. Thiele.

W. M. Hoyt, one-st'y addition to flats, North Water St.; cost, $2,500; builder, L. J. Daegling.

C. W. Woodman, two-st'y flats, 448 West Fifteenth St.; cost, $5,000.

New England Insurance Co., five-st'y store, 18-26 Van Buren St.; cost, $55,000; architects, Cobb & Frost.

Wm. Woerle, two-st'y dwell., 444 Dayton St.; cost, $4,000.

J. M. Love, 12 two-st'y dwells., Vernon Ave.; cost, $48,000; architect, W. M. Clay.

A. W. Waldo, two-st'y dwell., 281 Webster Ave.; cost, $3,000.

The Board of Education, four-st'y school-house, cor. Fifteenth St. and Wabash Ave., cost, $65,000; architect, J. J. Flanders.

J. Oleson, three-st'y dwell., 85 West Huron St.; cost, $5,000; architect, C. O. Hansen.

Denver, Col.

Building Permits.—W. H. Lawrence, Pearl St., two-st'y brick dwell.; cost, $4,500; F. E. Edbrooke & Co., architects.

E. & S. J. Anthony, Curtis St., three-st'y brick dwell.; cost, $5,000; E. Anthony, architect.

Chamber of Commerce building, Lawrence St., three-st'y brick dwell.; cost, $26,000; H. B. Seeley, architect.

School District, No. 2, Eleventh St., two-st'y brick school-house; cost, $21,000; Wm. Quayle, architect.

H. L. Chapin, Welton St., three-st'y brick dwell.; cost, $4,000; Varian & Sterner, architects.

Jackson, Ehmann & Co., Broadway, two-st'y brick block of 9 dwells. and 5 stores; cost, $25,000; Fred. A. Hale, architect.

J. G. Anderson & Sons, Stout St., three-st'y brick dwell.; cost, $5,000; E. P. Brink, architect.

Thos. S. Clayton, Sherman Ave., two-st'y brick dwell.; cost, $8,000; F. E. Edbrooke & Co., architects.

United States Custom-House, cor. Arapahoe and Sixteenth Sts.; M. E. Bell, architect.

J. A. Shreve, Larimer St.; three-st'y business block; cost, $14,000; W. H. J. Nichols, architect.

H. R. Fraser, Dailey St., two-st'y brick dwell.; cost, $4,000; Fred. A. Hale, architect.

H. E. Luthe, California St., two-st'y brick dwell.; cost, $6,000; R. S. Roaschlaub, architect.

Madame Jennie Rogers, Holladay St., three-st'y brick apartment-house; cost, $11,000; Frank Edbrooke & Co., architects.

J. A. Cooper, Grant Ave., two-st'y brick dwell.; cost, $12,000; M. Kenzie, architect.

S. C. Shepard, Grant Ave., repairs to dwell. and brick barn; cost, $2,500; Fred A. Hale, architect.

New York.

Plans have been filed for a new passenger-depot, to be erected just east of the Grand Central Depot, in Forty-second Street, by the New York Central & Hudson River and the New York & Harlem Railroad Companies. The building will have a frontage of 91′ in Forty-second Street, its depth will be 693′, and its general construction will be similar to that of the Grand Central Depot, the front being made of brick and cast-iron, with stone trimmings. The estimated cost is $200,000.

Building Permits. — *One Hundred and Sixty-third St.*, n w cor. Union Ave., three-st'y frame dwell., tin roof; cost, $3,000; owner and builder, John W. Decker, 841 Forest Ave.; architect, Adolph Pfeiffer.

One Hundred and Sixty-third St., n e cor. Tinton Ave., two-st'y frame dwell. and store, tin roof; cost, $3,000; owner, architect and builder, same as last.

Stanton St., No. 33½, five-st'y brick tenement, tin roof; cost, $17,000; owner, Johanna Noelke, 311 Fourth St., Jersey City; architect, Wm. Graul.

Forty-fifth St., n s, 100′ e Ninth Ave., 5 five-st'y brick tenements, tin roofs; cost, each, $18,000; owner and builder, Wm. Rankin, 338 West Forty-seventh St.; architect, M. Louis Ungrich.

Broome St., No. 385, five-st'y brick store, tin roof; cost, $15,000; owner, Patrick Skelly, 409 West Fourteenth St.; architect, John B. Snook.

One Hundred and Forty-third St., n s, 265′ w Brook Ave., 2 three-st'y frame dwells., tin roofs; cost, each, $3,500; owner and builder, W. L. Goetchius, 263 West Thirty-ninth St.

Park Ave., No. 259, two-st'y brick stable, asphalt roof; cost, $8,000; owner, T. G. Thomas, 294 Fifth Ave.; builder, J. H. L'Hommedieu.

West Thirty-fifth St., Nos. 126 *and* 128, 2 five-st'y brick flats, slate and tin roofs; cost, $40,000; owner, A. M. Hegeman, 1321 Broadway; architect, Daniel Burgess; builders, D. & E. Herbert.

PUBLISHERS' DEPARTMENT.

The AMERICAN ARCHITECT and BUILDING NEWS

Published Every Saturday by

JAMES R. OSGOOD & CO.,

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BUILDING INTELLIGENCE.

One Hundred and Fifty-seventh St., s s, 100′ e Terrace Pl., two-st'y frame factory, tin roof; cost, $5,500; owner, Francis J. Schmid, 232 Fifth St.; architect, Adolph Pfeiffer.

Madison Ave., s e cor. One Hundred and Fifth St., 6 three-st'y brick dwells., slate and tin roofs; cost, each, $7,000; owner and builder, Nicholas McCord. One Hundredth St., near Tenth Ave.; architects, Renwick, Aspinwall & Russell.

St. Nicholas Ave., n e cor. One Hundred and Fifty-fourth St., 4 two-st'y brick dwells.; cost, each, $12,000; owner, Harkness Boyd, on premises.

One Hundred and Thirtieth St., s s, 125′ w Seventh Ave., 2 four-st'y brick dwells., tin roofs; cost, each, $12,000; owner, Hannah M. Halpin, 215 West One Hundred and Thirtieth St.; architect and builder, Wm. J. Merritt.

Forty-second St., n s, 370′ e Vanderbilt Ave., one and part two-st'y brick and iron passenger railroad depot, corrugated-iron, slate and copper roofs; cost, $200,000; owner, N. Y. & H. R. R. Co., Grand Central Depot; architect, Wm. Lush.

East Seventy-seventh St., No. 328, five-st'y brick and stone tenement, tin roof; cost, $14,000; owner, Mrs. Gertrude Sossan, on premises; architect, Ernst W. Greis.

Fulton Ave., e s, 100′ s Sixty-eighth St., 6 two-st'y frame dwells., tin roofs; cost, each, $2,500; owner and builder, John Knox, 1167 Union Ave.

ALTERATIONS. — *Broadway*, s w cor. Forty-first St., internal alterations, to fit up for skating-rink; cost, $6,000; lessees, Northcote & Adams, 463 West Twenty-third St.; builder, Joseph Coar.

East Seventh St., No. 142, two-st'y brick extension, tin roof; cost, $3,000; owner, Astor Estate, lessee, Carl Stark, on premises; architect, Chas. Sturtzkober.

East Fifty-sixth St., Nos. 436 *and* 438, repair damage by fire; cost, $6,000; owner, Peter Doelger, 405 East Fifty-fifth St.; architect, Fred. Bernhardt; builder, M. Schmeckenbecher's Sons.

New St., Nos. 52 *and* 54, raise one story on front, take down and rebuild front wall, new entrance and stairs, elevators, etc., and fit up for offices; cost, $10,000; lessee, John E. Wylie, 64 College Pl.; architects, Babcock & McAvoy; builder, not selected.

One Hundred and Seventeenth St., n s, 250′ e Second Ave., finish building by putting in partition, etc.; cost, $4,000; owners, Bradley & Currier, 54 and 56 Dey St.; architect, James Finley; builder, not selected.

St. Louis.

BUILDING PERMITS. — Sixty-four permits have been issued since our last report, thirty-two of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

New Advertisements.

J. W. TAYLOR (Chicago, Ill.), Photographs. Page i.
BATES & JOHNSON (New York, N. Y.), Heating-Apparatus. Page viii.
E. VAN NOORDEN (Boston), Ventilator. Page viii.

BUILDING INTELLIGENCE.

Mrs. B. Stagg, two-st'y brick dwell.; cost, $2,500; Wm. Daman, contractor.

C. C. Hartman, two-st'y brick dwell.; cost, $4,800; W. C. Popp, contractor.

Joseph Machecech, two-st'y brick dwell.; cost, $4,800; W. C. Popp, contractor.

J. G. Zimmerer, 7 adjacent two-st'y dwells.; cost, $19,000; A. Beinke & Co., architects; W. C. Popp, contractor.

Wm. Harris, two-st'y brick dwell.; cost, $4,000; J. B. Legg, architect; H. E. Roach, contractor.

Fred. Tieman, 2 adjacent two-st'y dwells.; cost, $7,500; A. Beinke & Co., architects; Shildeman & Gross, contractors.

John Guhmann, two-st'y double brick dwell.; cost, $11,000; J. S. Taylor, architect; J. H. Keefe, contractor.

C. Fresh, two-st'y brick dwell.; cost, $2,500; J. Flavin, contractor.

C. H. Fisher, two-st'y brick dwell.; cost, $3,500; E. Janssen, architect; Paulus & Weidemuller, contractor.

C. H. Fisher, two-st'y brick dwell.; cost, $3,500; E. Janssen, architect; Paulus & Weidemuller, contractors.

P. Burns, six-st'y business house; cost, $18,000; Thos. Furlong, architect; sub-let.

Mrs. Ada V. East, two-st'y brick dwell.; cost, $4,000; H. A. Silence, contractor.

Mrs. Ida Scudder, 3 adjacent two-st'y stores and tenements; cost, $2,500; Love, contractor.

General Notes.

LONG ISLAND, N. Y. — The corner-stone of the crematory temple at Mt. Olivet Cemetery on Long Island was laid November 19.

STATEN ISLAND, N. Y. — Papers have been filed to-day in the office of the Secretary of State incorporating the St. George Improvement Company (limited), formed for the purpose of handling the land and water-front purchase recently made on Staten Island from the George Law Estate. The powers conveyed, in this instance under the act of 1875, are of varied scope, including not only the building and renting on Staten Island of docks, warehouses, and residences, but also the building of a casino or theatre, skating-rink, and the operation of playgrounds for cricket, base ball, lawn tennis, lacrosse, etc. The principal place of business named is New Brighton, and the special locality stated for the operations of the company is at St. George, the terminus of the Staten Island Rapid Transit Railroad. The incorporators are M. James Davis, Sir Roderick Cameron, Erasmus Wiman, Heman Clark, and Louis de Jonge, of New York.

WILLIAMSTOWN, MASS. — President Carter, of Williams, is to visit the Amherst and Harvard Gymnasiums, for the purpose of selecting suitable plans for a new gymnasium at Williams. There is now a fund of about $40,000, for the erection of the gymnasium.

Bids and Contracts.

JEFFERSON CITY, MO. — The following is a synopsis of the bids for stone and brick work of the basement walls of the court-house: —

J. M. Rice, Austin, Ill., $16,985.
J. McCarthy, Washington, D. C., $13,670.
J. H. McNamara, St. Louis, Mo., $14,890.

JACKSON, MISS. — The contract for joiner-work and wood-work on the custom-house and post-office has been awarded to the Robert Mitchell Furniture Company, of Cincinnati, O., at its bid, $11,320 for white-pine and white-oak.

COMPETITION.

AMERICAN ARCHITECT COMPETITIONS. — NEW SERIES.

As the busy season for this year has nearly passed, the younger men who have in past years evinced an active interest in the little competitions we have held from time to time, may be ready to test once more their skill in design in competition with their fellows.

THE PERMANENT

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Open free to the Public every business day of the year.

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Architects and visitors interested in building, from all parts of the country, are particularly invited to make this establishment their headquarters. Information and assistance will be extended to them, and use of writing and reading rooms gratis.

Visitors' Correspondence may be addressed in care of this establishment.

HENRY LORD GAY, Proprietor. T. S. HUTCHINSS, Manager.

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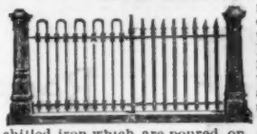

represents two of our patterns of Composite Iron-Railings. The upright, as well as the parallel bars, are continuous, and are joined by ornaments of chilled iron which are poured on, making a perfect panel without a joint. We have over one hundred different designs in this style of work and our prices are as low as the same quality of work in wrought or cast iron, but our Composite process is better than either. Gates and window-guards made in this way are the best in the world. We also make all kinds of iron-work from architects' designs.

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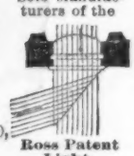

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From American Agriculturist, November 1880.

"We can gladly refer the reader to our recommendations of this firm and its paints in the past."

Send for Copy of our Pamphlet,

"STRUCTURAL DECORATION,"

with illustrations of prominent buildings and other structures painted with our paints.

Roof, Car, and Bridge Paints.

In seven colors. Are especially adapted for out-buildings, barns, fences, and for iron and rough woodwork.

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For the use of Artists, Decorators, and Painters. Are ground in refined Calcutta Linseed Oil, to a fineness not excelled by the best imported artist or "tube" colors to which they are fully equal in depth and brilliancy of color.

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For interlining frame buildings, floors, etc. It is wind, dust, and strictly fire-proof.

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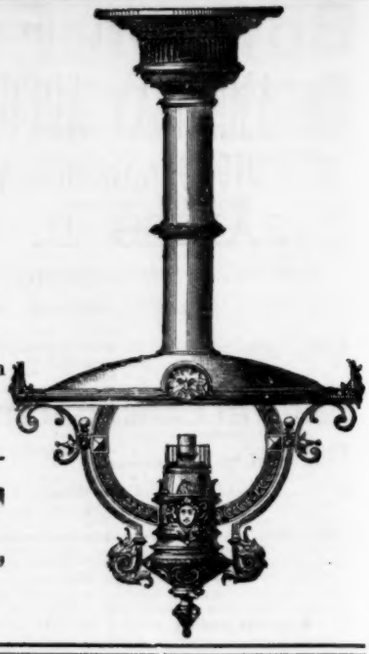

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COMPETITION.

Therefore we take pleasure in inviting their attention to the following

PROGRAMME.

Most people who live in the country, or in the suburbs of a large town, and have sufficient means, usually feel obliged to "set up their carriage," and of course a carriage implies horses, and a building in which the entire establishment can be housed. Therefore we propose as the subject of the present competition a barn such as the dweller in a house that has cost $5,000 would consider an appropriate adjunct of his establishment; but as this may be somewhat ambiguous, seeing that some men think more of their horses than they do of their families, we will say that the proprieties would be best observed if the cost of the barn should range between $1,000 and $1,500.

The barn must furnish accommodation for two horses and a cow; the carriage-room must be large enough for two wheeled vehicles and a sleigh; and proper provision must be made for harness, feed and hay, and the stableman must not be overlooked. Water and ventilation must also be kept in mind.

Required:—A perspective drawing of the barn, elevations of the sides not shown in the perspective, a plan or plans, and a reasonable amount of detail; all to be included on a single sheet, 21″ x 33″ within the framing lines. A short description and the result of a *bona fide* estimate must also be furnished. For the best three designs we will pay equal prizes of thirty dollars each.

Conditions:— Drawings must be received at the office of the *American Architect*, on or before Saturday, December 20, 1884.

The three prize drawings are to remain the property of the publishers.

All designs submitted are subject to publication in the *American Architect* at the pleasure of the editors.

All designs must be sent in signed only by a motto —*not a graphic symbol*—the name and address of the author being sent enclosed in a sealed envelope, endorsed with a duplicate motto.

The jury of award will be composed of three architects.

PROPOSALS.

JETTY.

[At Christiana River, Del.]

U. S. Engineer Office, 606½ Market St., Wilmington, Del., November 11, 1884.

Sealed proposals, in triplicate, will be received at this office **until 12 o'clock, noon, of December 10, 1884,** for furnishing the materials and work required for building an additional height of four feet of crib work on the jetty now standing at the Christiana River, Del., also for the sheet piling and stone filling required.

Specifications, etc., and all desired information can be had on application to

WM. F. SMITH,
467 United States Agent.

IRON LIGHT-HOUSE.

[At Croatan Sound, N. C.]

Office of the Light-House Engineer, Fifth and Sixth Districts, Baltimore, Md., November, 1884.

Sealed proposals will be received at this office **until 12 o'clock,** M., **of Saturday, the 13th day of December, 1884,** for furnishing the materials and labor of all kinds necessary for the completion of the metal-work of the Croatan Light-House, Croatan Sound, N. C.

Plans, specifications, forms of proposal and other information may be obtained on application to this office.

The right is reserved to reject any or all bids, and to waive any defects.

JARED A. SMITH,
Major of Engineers, U. S. A.,
467 Light-House Engineer, 5th and 6th Districts.

POST-OFFICE LETTER BOXES.

[At Ottawa, Canada.]

Department of Public Works, Ottawa, November 17, 1884.

Sealed tenders addressed to the undersigned, and endorsed "Tender for Post-Office Letter Box Fronts," will be received **until Monday, 15th,** proximo, inclusive for the supply of about 10,000 post-office letter box fronts.

PROPOSALS.

Parties disposed to submit tenders may obtain forms of tender, specification, and any further particulars at this department.

Parties tendering will be required to submit with their tenders a sample of the box they are prepared to provide.

Tenders will not be considered unless made on the printed form supplied, and signed with the actual signatures of the parties tendering.

The department will not be bound to accept the lowest or any tender.

By order, F. H. ENNIS,
468 Secretary.

CITY-HALL.

[At Richmond, Va.]

City Engineer's Office, Richmond, Va., October 15, 1884.

Sealed proposals are invited **until December 1st, at 12 o'clock,** M., for building a new city-hall at Richmond, Va.

Drawings, specifications, and printed forms can be seen at this office.

The Committee on Grounds and Buildings reserves the right to reject any and all bids.

For further information apply to the undersigned.
466 W. E. CUTSHAW, City Engineer.

CATHEDRAL.

[At Kingston, Ont.]

Sealed tenders will be received **up to noon on Saturday, the 20th December,** for the completion of St. Mary's Cathedral, Kingston, Ont., which comprises principally the building of the main tower and spire in stone from the ground line to the height of 292 feet. Also the completion of four stone turrets to the height of 112 feet, and two turrets to the height of 160 feet. Plans and specifications to be seen at the Bishop's Palace, Kingston, Ont., and at the office of the undersigned, 235 Wilbrod St., Ottawa, after the 25th inst., where printed forms of tender and all necessary information can be obtained.

Tenders to be addressed to the Chairman of Improvement Committee Kingston Cathedral.

The lowest or any tender not necessarily accepted.
468 JAMES R. BOWES, Architect.

BRIDGES.

[In Nebraska.]

Department of the Interior, Office of Indian Affairs, Nov. 17, 1884.

Sealed proposals, endorsed "Proposals for Building Bridges," will be received at this office **until 1 o'clock, Tuesday, the 16th day of December, 1884,** for the construction of three bridges on the Santee Sioux Reservation in Nebraska and Ponca Reservation in Dakota, at the following locations: on the Santee Reservation over the Bazile Creek, a bridge of three spans of sixty feet each, with fifteen feet approaches; on the Ponca Reservation, over the Niobrara River, a bridge nine hundred and sixty feet from end to end, and over the west fork of said river a span of sixty feet.

The bridges in question are to be of combination of wood and iron, with cast-iron shoes, resting on pile foundations, which over the Niobrara River are to be driven fifteen feet, over Bazile Creek thirteen feet, and over west fork of Niobrara River, fifteen feet, below water-level, and are to be built in accordance with plans and specifications to be seen at the offices of the Depot Quartermaster, at Omaha, Neb., the *Times*, of Denver, Col., and of the *Inter-Ocean*, of Chicago, Ill.

The construction of the bridges to be under the immediate supervision of a person to be designated by this department.

All bids must be accompanied by a certified check on some United States Depository, for at least five per centum of the amount of the proposal, which check will be forfeited to the United States in case any bidder or bidders fail to execute a contract with good and sufficient sureties; otherwise to be returned to the bidder.

In submitting bids, bidders should state the time required by them for the construction of the bridges, as this matter will be considered in making the awards, and made a part of the contract.

The right is reserved to reject any or all bids, or any part of any bid, if deemed for the best interest of the service. H. PRICE, Commissioner.
468

PROPOSALS.

BALCONIES.

[At Washington, D. C.]

Office Supervising Engineer and Architect, New Pension Building, Washington, D. C., November 11, 1884.

Proposals are invited for the decorative wrought-iron work of one or two bracket balconies, 70′ x 5′ in the new Pension Building.

Drawings and specifications are to obtained from this office. Proposals opened **at noon of 3d December.**

M. C. MEIGS,
466 Supervising Engineer and Architect.

STEAM-HEATING APPARATUS.

[At Memphis, Tenn.]

Office of Supervising Architect, Treasury Department, Washington, D. C., November 17, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 8th day of December, 1884,** for supplying and putting in place complete in the Marine Hospital building at Memphis, Tenn., a low pressure return circulation steam-heating apparatus, in accordance with drawings and specification, copies of which and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
466 Supervising Architect.

STONE AND BRICK WORK.

[At Rochester, N. Y.]

Office of Supervising Architect, Treasury Department, Washington, D. C., November 12, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 13th day of December, 1884,** for furnishing and setting all the stone-masonry, and supplying and laying all the brick masonry required for the basement and superstructure of the court-house, post-office, etc., building at Rochester, N. Y., in accordance with the drawings and specification for each class of work, copies of which may be seen and any addititional information obtained on application at this office, or the office of the Superintendent, on and after November 20.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
466 Supervising Architect.

TIMBER, BOLTS AND STONE.

[Near Pt. Pleasant, W. Va.]

United States Engineer Office, Cincinnati, O., October 23, 1884.

Setled proposals in duplicate, will be received at this office **until noon** (local time) **on Monday, the 8th day of December, 1884,** for furnishing material and building two ice piers in the Great Kanawha River near Point Pleasant, West Va.

Approximate quantities of material required: —

204,472 feet B. M., oak timber.
9,536 lbs iron drift bolts.
2,486 cubic yards rip-rap stone.

Specifications and blank forms for proposals will be furnished on application to this office. Letters asking specifications should be marked "Official Business" on the envelope.

WM. E. MERRILL,
466 Lt.-Col. of Engineers.

TIMBER.

[At Chicago, Ill.]

United States Engineer Office, 25 Honore Building, Chicago, Ill., November 8, 1884.

Sealed proposals in triplicate, will be received at this office, **until 12 o'clock, noon, Tuesday, December 9, 1884,** for furnishing pine and hemlock timber for breakwater construction at Chicago, Ill. The total amount required will be about two millions one hundred and sixty-seven thousand (2,167,000) feet B. M., to be delivered between the opening of spring navigation and September 1, 1885.

Parties who are not prepared to furnish the entire lot may submit propositions for a portion only, but not for less than two cribs.

For specifications, blanks for proposals, and all information, apply at this office.

WM. H. H. BENYAURD,
466 Major of Engineers, U. S. A.

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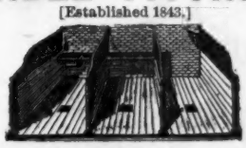

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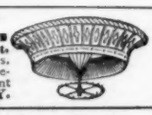

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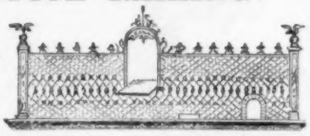

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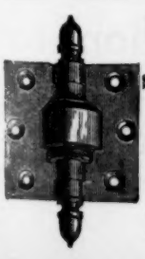

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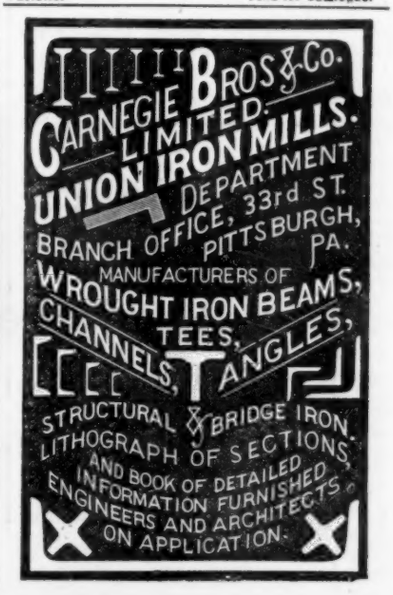

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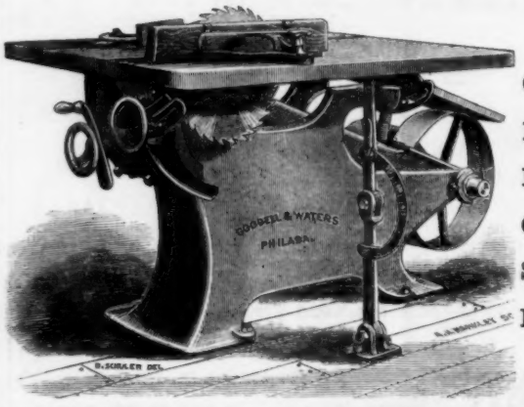

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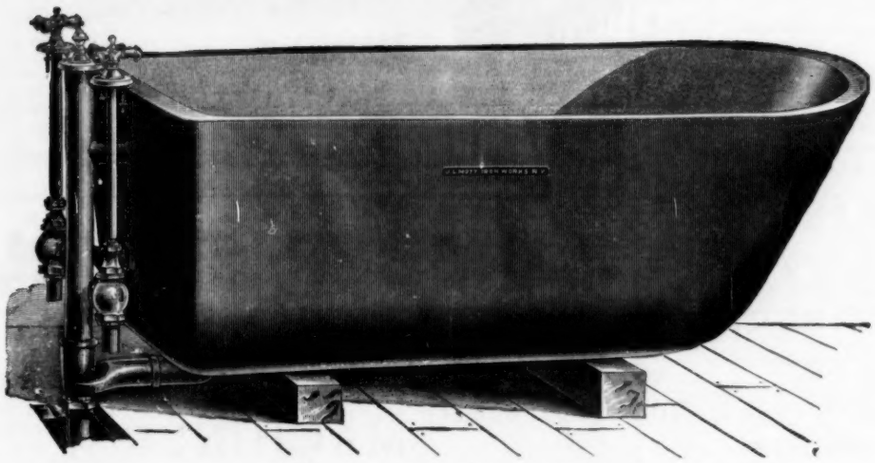

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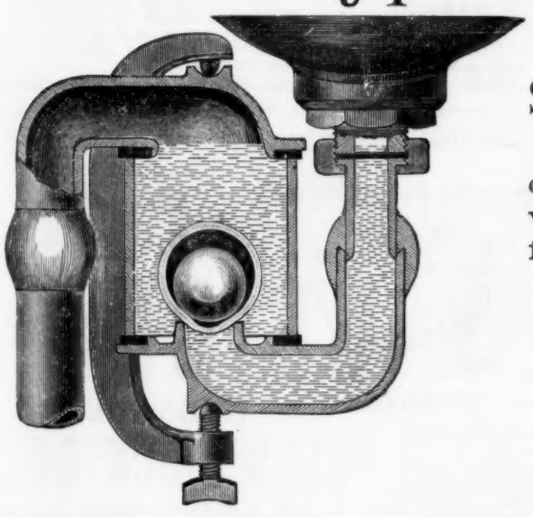

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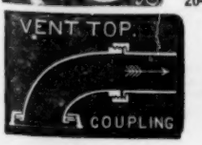

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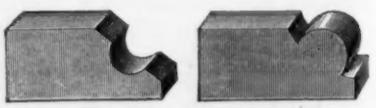

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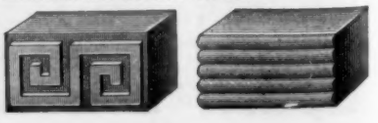

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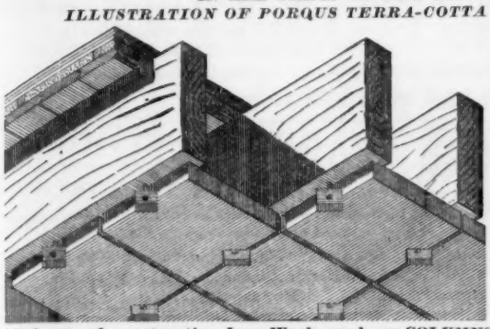

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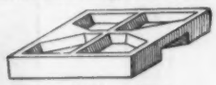

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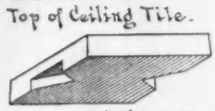

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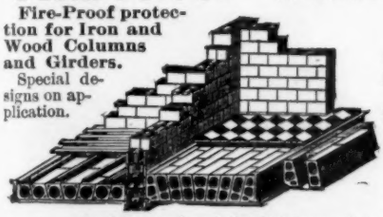

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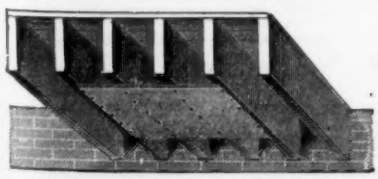

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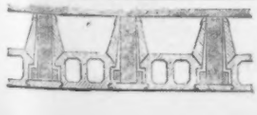

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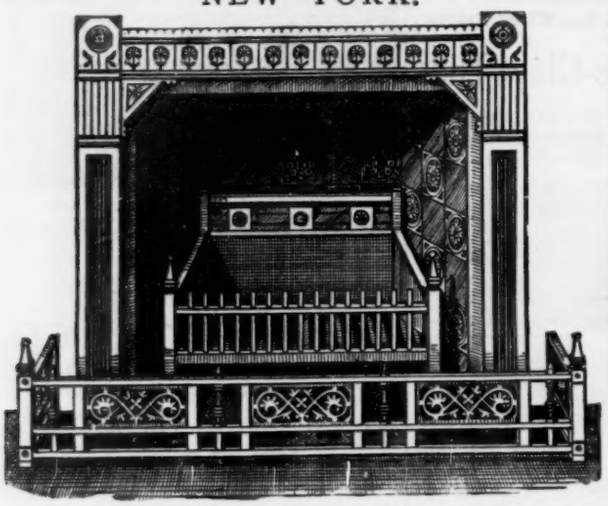

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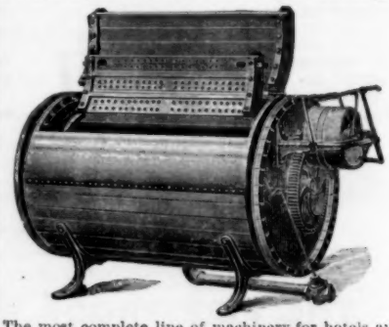

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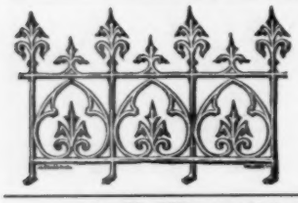

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